B O S T O N   U N I V E R S I T Y

COLLEGE OF BUSINESS ADMINISTRATION

T H E S I S

An Economic Study of a Puerto Rican Sugar Company

by

Edwin Woodland Lightfoot

(B.S. Boston University 1932;
C.P.A. New York 1937)

Submitted in partial fulfillment of
the requirements for the degree of

MASTER OF BUSINESS ADMINISTRATION

1 9 4 1

INTRODUCTION

The economy of Puerto Rico is almost entirely an agricultural one and in it sugar is the most important industry. It is an industry which is mostly agricultural but partly manufacturing. It has many more ramifications than meet the eye of the casual observer. Its problems are numerous and multi-sided. The industry as a whole has been prescribed for and legislated for and against. So far as is known, however, no single company has ever been made the subject of a study which starts at the beginning and, assuming no knowledge of the industry whatsoever on the part of the reader, attempts to make an impartial objective analysis of that company and its structure, functions, and problems. In a manner of speaking, the present study puts the subject company, Central San José, Inc. of Río Piedras, Puerto Rico, under the economic microscope to see what lies within and what makes it function, but at the same time having in mind its representativeness of the industry itself. Even there, perhaps some qualification is necessary in referring to any one company as representative. While all of the sugar companies in Puerto Rico are engaged in performing similar functions, there are, perforce, many differences existing among individual companies which must be recognized at the outset. The company selected for this study is probably as representative as any single company could be under the circumstances. From the point of view of size, as measured by physical production

of raw sugar, it lies extremely close to the average for all Puerto Rican companies. The general nature of its operations and problems are common to the industry, but it should be realized that beyond that point there are numerous minor variations between the company and the other sugar companies of the island.

Sugar and its problems are all-important in Puerto Rico but there are many other economic problems in the island which await solution. It is not within the province of this study to make any examination of them except as they may indirectly be related to sugar or to the company.

As for literature on the general subject of sugar and, more directly, Puerto Rican sugar, there is a paucity of unbiased material. The most impartial and most complete study of sugar in Puerto Rico is that entitled, "The Sugar Economy of Puerto Rico" by Gayer, Homan, and James. Although it was written as recently as 1936, it does not bring the subject quite up to date because of several significant developments since that time. This refers to the effects of the Agricultural Adjustment Administration program, the decision of the United States Supreme Court in a case involving the "500-Acre Law", the passage of the Fair Labor Standards Act, etc. The extent to which the present study has made use of the material in this book, however, is not entirely indicated by the references to it in the pages which follow.

The Association of Sugar Producers of Puerto Rico has published much worthwhile material on the subject. It consists principally of booklets and pamphlets bearing on various phases of the industry in Puerto Rico. The point of view expressed in much of its literature, however, is the company point of view and must be interpreted accordingly. The association has unearthed a great deal of valuable factual information for any student of the industry but it is all utilized in defense of the industry. In none of its literature does one find any criticism of the industry nor are any data presented which might be used against it. Obviously, no industry is above reproach but neither is there one which is completely humanitarian.

In the early part of 1937 Esteban A. Bird, assisted in part by Professors Rafael Picó and Rafael de J. Cordero of the University of Puerto Rico, completed an important study of the industry in Puerto Rico under the auspices of the Puerto Rico Reconstruction Administration ("The Sugar Industry in Relation to the Social and Economic System of Puerto Rico"). The method of approach is diametrically opposed to that of the Association of Sugar Producers of Puerto Rico. It subjects practically the entire industry to a scathing attack. The authors are almost unwilling to believe that the industry could ever be capable of doing anything good or anything right. It accepts the belief that the industry is essential to Puerto Rico but strongly emphasizes the need of

a thorough-going job of reform to make it a useful part of society. A prominent sugar man expressed the view to the author that it was a "libel on the sugar industry of Puerto Rico". Whether for that reason or for some other more obscure reason, the fact remains that for four years it was unpublished. In early 1941 it was directed to be published by the Senate of Puerto Rico. Regardless of whether one chooses to believe or disbelieve the accusations which it levels at the industry, it contains a plenitude of data regarding the island's foremost industry.

In 1930 the Brookings Institution sponsored an economic and social survey of Puerto Rico. A staff headed by Victor S. Clark published its findings under the title, "Porto Rico and Its Problems". The study was not primarily concerned with the sugar industry but with the broader questions affecting almost every phase of the island and its life. It was a serious, thoughtful, and impartial study which still stands alone among any work of its kind. There has been hardly a study of any insular problem made subsequently which has not drawn upon the findings embodied in that report.

The present study is organized along the lines indicated in what follows. The importance of sugar in the economic life of Puerto Rico is briefly discussed in order to provide background for the remainder of the study. While it has avoided, so far as possible, the technicalities of cane growing and sugar processing, it has been deemed advisable

to present a condensed description of the stages and processes which must be gone through before the raw sugar emerges from the mill (central). The importance of the independent cane farmer (colono) has been recognized with a chapter on the relations between the company and its colonos. Changes in methods of production and improvements in the yields obtained have played their part in the development of the company to the point which it has attained to-day. The background and financial history of the company are surveyed. An analysis of the sugar dollar has been included as being of considerable interest. Attention is given to the place of labor and how it has been obtained. Regulatory legislation has become of the greatest import and the more significant pieces of legislation are examined, both for their provisions and effects. And finally there is a summary of the findings and conclusions reached.

It should be pointed out that in 1932 an Act of Congress officially bestowed the name "Puerto Rico" upon the island. Prior to that time it had been widely known as "Porto Rico", and the writings of that previous period refer to it by its former name. In this study the present name is used except when referring to some source using the former name.

Throughout the study the use of the name of the company has been intentionally minimized in order that attention may be focused upon the material presented rather

than upon a name.

The author wishes to record his indebtedness to Mr. Jaime Annexy and Mr. Alfonso Vázquez, officials of the company, who so kindly placed the necessary information at his disposal and thus made possible the study. To Mr. Bernardo Soler Roure, of Central San José, Inc., there is due a special acknowledgment; for giving so generously of his time and his knowledge, for assembling and compiling data, for interpretive comments, and for assistance in reading the manuscript, there is a deep obligation. The author is grateful to his wife for her painstaking review of the manuscript and for her patience in providing the point of view of the laity. It is a pleasant duty also to express gratitude to numerous others who so willingly gave their assistance by furnishing information and suggestions.

C O N T E N T S

CHAPTER ONE

THE IMPORTANCE OF SUGAR IN THE ECONOMY OF PUERTO RICO

Historical development.

Puerto Rico, together with several minor satellite islands, lies in the West Indies, being the fourth largest island of the Greater Antilles. It has an area of 3,435 square miles (the main island being approximately 100 miles by 35 miles), which is roughly three times that of the state of Rhode Island. Physically, it is entirely a terrain of mountains and valleys, with the exception of a coastal belt which takes the form of a plain. It has an equable climate and a somewhat uniform temperature throughout the year. The variable rainfall provides abundant precipitation in the northern part of the island but an uneven distribution in the southern part, which has been partly counteracted through the use of irrigation. Sugar cane is the major crop, the flat coastal belt being devoted almost entirely to it. Other crops include tobacco, coffee, coconuts, pineapples, and citrus fruits.

The first sugar cane in the new world was brought by Christopher Columbus in 1493 and the sugar industry is credited with being the oldest in this hemisphere. (1). In 1515 sugar cane was first introduced into Puerto Rico from the neighboring island of Santo Domingo and has occupied an

(1) Smith, Dudley, and Requa, William M., Puerto Rico Sugar Facts, (Washington, 1939), p. 3.

important position since that time. The manufacture of edible molasses was first begun in a mill built in 1523 and a water power mill, making a type of sugar, had its inception in 1548. (1). These early mills were rather crude affairs for the most part, using animal or water power to turn their wooden rollers and press the juice from the cane. They employed open kettles to boil the juice and concentrate it to the point at which crystallization of the sugar took place. A considerable quantity of molasses adhered to the crystals and it was necessary to place them in draining racks to separate the sugar from the molasses. By comparison with a modern mill these original mills bordered on the primitive and their capacity and efficiency did not begin to approach present standards. For example, their recovery of sugar was only 40% to 60% of the sugar in the cane, largely due to the fact that only a portion of the juice was extracted and, once extracted, was not entirely separated from the molasses. (2). To-day about 95% of the sugar is recovered.

In those early days the principal means of transportation was by ox-cart, and it was almost a necessity that the mill be located adjacent to the cane fields. It was customary for the mill to grind and process only the cane

(1) Farr's Manual of Sugar Companies, (New York, 1940), p.188.

(2) Smith, Dudley, and Requa, William M., Puerto Rico Sugar Facts, (Washington, 1939), p. 3.

which had been grown by the owner. As a result, the size of the mill was determined by the area of land employed by the owner in the cultivation of cane, and the owner controlled both mill and fields.

About 1600 Puerto Rico had eleven sugar mills whose aggregate annual production was only 190 tons. A hurricane in 1615 almost laid the industry in ruins. Trade restrictions in Spanish markets and a shortage of shipping facilities during the seventeenth and the first half of the eighteenth century kept production down so that in 1776 there was only an annual output of 135 tons. (1). From that time to 1850, when total production was 56,000 tons, there was a fairly uniform rate of growth because of favorable changes in marketing conditions. During the years from 1850 to 1900, in which latter year the first effects of the American regime began to be felt, production followed an irregular course, reaching a high of 170,000 tons in 1879 and a low of 39,000 tons in 1899. (2). The latter part of the nineteenth century saw the construction of a few central type mills with improvements in machinery. Nevertheless, small individually owned mills accounted for most of the production as late as 1898, when there were 345 mills in the island with an average

(1) López Domínguez, Francisco, Origin and Development of the Sugar Industry in Puerto Rico, (unpublished manuscript).

(2) Puerto Rico Department of Agriculture and Commerce, Annual Book of Statistics (1939), p. 130.

daily grinding capacity of only 36 tons of cane each. (1).

Since the date of the American occupation and the inclusion of the island within the United States tariff wall, there has been a remarkable change in the insular sugar organization, resulting in the almost complete elimination of the small mill and the integration of the industry into 41 modern centrales, built to a large extent by new capital attracted by the possibilities of sugar production in Puerto Rico. During this same period there was an increase in the rated daily grinding capacity of approximately five times. (2). The following production figures, given at five-year intervals, show clearly the growth of the industry during these years: (3).

Crop Year	Short Tons of Sugar (000 omitted)
1899-1900	81
1904-05	214
1909-10	349
1914-15	345
1919-20	485
1924-25	660
1929-30	866
1934-35	773
1939-40	1,019

To make this tabulation complete, it should be pointed out

(1) Census of Puerto Rico - 1899, p. 155.

(2) del Valle, Manuel A., Proceedings of the International Society of Sugar Cane Technologists, (San Juan, 1932).

(3) Puerto Rico Department of Agriculture and Commerce, Annual Book of Statistics (1939), p. 130 for years 1900 to 1935; year 1939-40 obtained from Association of Sugar Producers of Puerto Rico.

that in the crop year 1933-34 production reached 1,103,000 short tons, but the Agricultural Adjustment Administration imposed its restrictive program in 1935 causing an abrupt reversal in the growth trend.

The production for the crop year 1939-40 requires a word of explanation. Following the outbreak of war in Europe, it was feared that consumers might resort to hoarding and cause a shortage of sugar in the American market. Accordingly, on September 11, 1939, President Roosevelt issued a proclamation temporarily suspending the sugar quotas as an emergency measure. The quotas remained suspended until December 27, 1939, and during the intervening time there were no restrictions on the production of sugar in those areas governed by the sugar quotas. As a result, the island had the benefit of a period of three and a half months of unlimited production.

As an indication of the potential production of Puerto Rico, the Sugar Section, Agricultural Adjustment Administration, Department of Agriculture, has estimated that in the crop year 1938-39, if the entire production of cane had been used for sugar, there would have been produced 1,217,000 short tons of sugar. (1). Some cane was cut and ground solely for molasses.

(1) Smith, Dudley, and Requa, William M., Puerto Rico Sugar Facts, (Washington, 1939), p. 116.

Reasons for what is essentially a one-crop economy.

About 50% of the crop land in Puerto Rico is devoted to the cultivation of sugar cane. Value-wise, this land accounts for 81% of the total land in crops. Judged also by other standards, such as number of people employed and the position of sugar among the exports of Puerto Rico, it is, for all practical purposes, a one-crop economy. These points are subsequently discussed in more detail.

The island has an extremely dense population (544 people per square mile or 1.18 acres per capita) (1), exceeded by only a few other areas of the earth. It is this factor, together with limited natural resources, which chiefly accounts for Puerto Rico's highly intensive cultivation. Sugar provides large yields per acre which will buy, on the average, several times as much food as the same land will grow. It has been shown that,

> "On the basis of 1938 yields and prices, the returns from one acre of sugar cane will buy the production of from four to twelve acres of other crops produced in the island, and, on the basis of the island's purchases of wheat flour, corn, corn meal, rice, potatoes, beans, and peas, the products from more than eight acres in the mainland." (2).

The island is peculiarly fitted by a combination of soil, rainfall, temperature, a large supply of cheap labor,

(1) Sixteenth Census of the United States - 1940, (preliminary).

(2) Puerto Rico Department of Agriculture and Commerce, What Sugar Means to Puerto Rico, p. 28.

and especially the inclusion within the United States customs area, and contiguity to the American market, to be one of the world's foremost producers of sugar. The material advantage of being behind the United States tariff wall can be best demonstrated by reference to the tariff on sugar imported into the United States. At present, standard raw sugar testing 96° bears a duty of 0.9 cents per pound when it comes from Cuba, and 1.875 cents per pound when it is full duty sugar from other countries. (1). In addition to this group of elements, there must also be noted the fact that the cane farms of the island use large amounts of commercial fertilizer to maintain the fertility of the land.

The result of all this is that Puerto Rico produces a greater amount of sugar in proportion to its area of cane land than any other sugar producing area in the western hemisphere. Its yield of sugar is currently 10% more than that of Peru, more than twice that of Cuba and the mainland, and three times as high as that of Argentina and Brazil. (2).

Position among the cane sugar producing areas of the world.(3).

In the crop year 1939-40, based in part on estimates, the world produced some 30,000,000 long tons of cane and beet sugar combined. Beet sugar production was roughly 11,100,000

(1) Farr's Manual of Sugar Companies, (New York, 1940), p. 158.

(2) Smith, Dudley, The Job Being Done by Sugar in Puerto Rico, (Washington, 1940), p. 13.

(3) Farr's Manual of Sugar Companies, (New York, 1940), p. 164.

long tons, of which the countries of Europe produced 86%, the remainder being accounted for principally by continental United States. The cane sugar production of the world in that year was distributed as follows:

Area	Long Tons (000 omitted)		Percentage of World Production	
United States and possessions:				
PUERTO RICO	982		5.2	
Philippine Islands	916		4.8	
Hawaiian Islands	850		4.5	
Florida and Louisiana	464		2.5	
Virgin Islands	7		—	
		3,219		17.0
Asia:				
British India	4,359		23.1	
Java	1,452		7.7	
Japan	1,327		7.0	
		7,138		37.8
West Indies (except Puerto Rico and Virgin Islands):				
Cuba	2,817		15.0	
Dominican Republic	445		2.3	
British West Indies	315		1.7	
French West Indies	110		.6	
Haiti	44		.2	
		3,731		19.8
Central and South America:				
Brazil	1,112		5.9	
Argentina	520		2.7	
Peru	400		2.1	
Mexico	300		1.6	
All others	345		1.8	
		2,677		14.1
Australia and Fiji Islands		1,062		5.6
Africa		1,057		5.6
Spain		13		.1
Total		18,897		100.0

Considering its small size, it is readily apparent that the productivity of Puerto Rico, with 5.2% of the world's production, places it in the front rank of the sugar producing areas of the world.

Position in the American sugar market.

The consumption of sugar by the United States during the year 1939, based on Willett and Gray statistics, amounted to 5,648,000 long tons. The sources of supply are best shown in the following tabulation, which also shows a comparison of source percentages with the year 1929: (1).

Source	1939 Long Tons (000 omitted)	1939 %	1929 %
Cuba	1,403	24.9	51.9
Domestic beet	1,392	24.7	14.8
Philippine Islands	793	14.0	10.4
PUERTO RICO	788	13.9	6.6
Hawaiian Islands	743	13.1	13.3
Domestic cane	518	9.2	2.7
Other sources	11	.2	.3
Total	5,648	100.0	100.0

The principal point to be noted in connection with this summary is that during the last ten years the Puerto Rican share in the American market has doubled. While both the mainland and the Philippines have also been increasing their proportion, that of Cuba has been halved. The depression, with its concomitant low world price of sugar, demoralized the industry in Cuba, while at the same time those places included within the United States customs area were able to expand at the expense of Cuba. Comparative figures show that over a period of years Puerto Rico's share has been approximately 30% of the total American insular (offshore)

(1) Farr's *Manual of Sugar Companies*, (New York, 1940), p. 7.

production. (1). It produces chiefly for the American market. In recent years only about 7% of its total production has been retained for local consumption. (2).

Distribution of imports and exports. (3).

During the year 1938 Puerto Rico exported merchandise with an aggregate value of $86,500,000, of which $84,660,000, representing 97.9%, went to continental United States and the remainder to other countries. This volume placed the island in ninth position in order of magnitude of countries supplying the United States. In that same year Puerto Rico imported merchandise to the extent of $88,700,000, the mainland furnishing $80,750,000, or 91%, and other countries the balance. These purchases by the island made it the tenth best customer in all the export trade of the mainland.

The most important item included in the Puerto Rican export figure given above was raw and refined sugar, $54,500,000, accounting for 64% of total exports. Next in importance were cotton, linen, and silk manufactures - $12,325,000, tobacco and tobacco products - $9,190,000, and rum - $2,770,000. The remainder of $5,875,000 was scattered

(1) U.S. Tariff Commission, Report to the President on Sugar, Report No. 73, Second Series, (Washington, 1934), p. 137.

(2) Smith, Dudley, and Requa, William M., Puerto Rico Sugar Facts, (Washington, 1939), p. 117.

(3) Department of Commerce, Statistical Abstract of the United States (1939), pp. 484-489, 587, 590-592.

over items of comparatively minor significance.

The composition of the Puerto Rican imports covers a wide variety of articles. Most important were animal and vegetable food products - $27,675,000, machinery, metal manufactures, and chemical products - $20,450,000, and textile manufactures - $14,510,000. The balance consisted of those items which are needed but not supplied by a basically agricultural economy of the Puerto Rican type.

Land devoted to raising of sugar cane.

As of June 30, 1939 there were devoted to agricultural crops in the island 604,310 acres, of which 303,055 acres, or 50%, were used in the cultivation of sugar cane. Coffee acreage was a poor second with 131,738 acres (22%), and the remaining crop land was distributed over tobacco, pineapples, oranges, coconuts, and minor fruits and vegetables. Using average assessed values per acre, which are considered extremely conservative and are taken for the island as a whole, the aggregate value of crop land was $62,000,000, of which cane land accounted for $50,000,000, or 81%. (1).

The following table is included here to show the distribution of farms of sugar cane growers, by acreage in sugar cane in 1935, although the total acreage reported is not in complete agreement with the figure reported by the

(1) Based on data from Annual Report of the Treasurer of Puerto Rico (1938-39), pp. 82-85.

Treasurer of Puerto Rico referred to above. (1).

Cane Acreage	Number of Farms	Acres in Cane
2 or less	2,736	3,954
3 to 10	2,905	15,285
11 to 25	986	16,079
26 to 100	752	37,086
101 to 200	141	20,098
201 to 500	114	35,259
Over 500	59	190,231
Total	7,693	317,992

Centrales (mills): capacity and other features.

The 41 centrales in Puerto Rico at the present time have, generally speaking, extremely modern equipment and are efficiently managed. There are certain general aspects pertaining to them which are worthy of comment at this juncture. Because their raw material (cane) is unwieldy and subject to deterioration, it is essential for best results that the central be located close to the supply of raw material. Once the grinding of the cane gets under way, shutdowns are costly and wasteful; there must be a continuous, un-interrupted flow of cane into the mill. This calls for meticulous timing in planting and cutting the cane. Largely because of these reasons, most centrales produce varying proportions of their cane themselves. Another result of these circumstances is the maintenance of a close personal relationship between the central and the colonos (independent cane farmers) who take their cane to the central to be ground and processed.

(1) Sugar Section, Agricultural Adjustment Administration, Department of Agriculture, August 24, 1936.

These features will receive more attention in ensuing pages.

The various centrales are rated as to their daily capacity for grinding cane and their production tends relatively to follow the rated capacity. There is a wide variation among them on the basis of rated capacity; they range from Central Guánica with a rated capacity per 24 hours of 8,000 short tons of cane, followed by Central Aguirre with 4,500 tons and Central Fajardo with 4,400 tons, to Central Herminia and Central Pellejas with only 150 tons each. The average capacity for all centrales is 1,521.5 short tons of cane per day. (1).

Actual output of raw sugar for these same centrales in 1938-39 was as follows: (2).

Central	Production (short tons)
Guánica	86,936
Fajardo	56,123
Aguirre	55,043
Pellejas	4,034
Herminia	1,969

For that same year the average production of raw sugar for all centrales was 21,299 short tons.

With only a few exceptions, all of the centrales devote themselves entirely to the production of raw sugar and molasses. Those which also engage in refining are occupied not only with the needs of the local refined sugar market

(1) Gilmore's Puerto Rico Sugar Manual (1934).

(2) Farr's Manual of Sugar Companies, (New York, 1940), p. 190.

but with exporting to the mainland as well.

Number of people employed by the sugar industry.

It is not definitely known how many people are directly employed by the sugar industry in Puerto Rico. The United States census, while showing the number of people employed in agricultural and manufacturing industries, gives no breakdown from which the number employed by the sugar industry might be determined. Estimates have been made which vary from 100,880 (1) to 150,000 (2). Somewhere between these two extremes will probably be found the true number of workers. The highly seasonal nature of the operations of the industry adds to the difficulties encountered in determining the actual number of workers.

On the basis of questionnaires circulated by the Association of Sugar Producers of Puerto Rico, the association estimated that in 1933-34 the maximum number of workers employed by the sugar industry and earning $50 or less a month was 123,646, of which 113,161 were field workers and 10,485 were mill workers. Inasmuch as this represents the maximum number employed, it denotes an estimate made during the "busy season" when employment had reached a peak. The 113,161 field workers were 43% of the 261,789 workers shown

(1) Bird, Esteban A., The Sugar Industry in Relation to the Social and Economic System of Puerto Rico, Puerto Rico Reconstruction Administration, (1937), p. 24.

(2) López, William D., The Labor Problem in Puerto Rico, Puerto Rico Department of Labor, (1935), p. 2.

as employed in agriculture by the census of 1930. (1).

The figures of the Puerto Rico Reconstruction Administration, which are based on a special census conducted by it in 1935, show the following distribution of agricultural workers ten years of age and over: (2).

Crop	Percentage of Workers
Sugar cane	48
Coffee	18
Tobacco	16
Minor crops	12
Fruits	2
All others	4
Total	100

Reliable estimates indicate that during the ten-year period ended in 1939, sugar payrolls averaged approximately 45% of all wages paid in the island. (3).

Without attempting to ascertain the number of people in Puerto Rico indirectly dependent upon sugar, the data above serve to testify to the importance of sugar in the insular economy. It is conceivable that the United States might be able to get along without Puerto Rico as a source of sugar, but in the words of a recent study by Messrs. Gayer, Homan, and James,

> "To-day Puerto Rico depends almost completely on United States markets. The economic and social significance of this arrangement is

(1) Fifteenth Census of the United States: 1930, Occupation Statistics, Puerto Rico, pp. 5-6.

(2) Op. cit., p. 8.

(3) Smith, Dudley, and Requa, William M., Puerto Rico Sugar Facts, (Washington, 1939), p. 25.

"of absolutely prime importance. It has so profoundly affected all aspects of Puerto Rico's life, social, economic, and political, that any sudden alteration would probably cause a complete economic breakdown, with correlative collapse in all spheres of social organization." (1).

(1) Gayer, A.D., Homan, P.T., and James, E.K., The Sugar Economy of Puerto Rico, (New York, 1938), p. 35.

CHAPTER TWO

GROWING, PROCESSING, AND MARKETING

Requirements as to soil and climate.

Sugar cane grows to a height of fifteen feet and varies from one to two inches in diameter. It is not unlike a large corn stalk in appearance, consisting of a stem and leaves which are long and tapering. The stalk is made up of short sections which are connected by nodes having a bud or eye. When pieces of the stalk are planted as seed cane this bud expands and breaks, putting forth a young cane with a single leaf, followed later by other leaves. Originally green in color, it may continue that color or, depending on the variety, turn purple, striped, or yellowish green. As it continues to grow, the original leaves (now at the base of the plant) turn yellow, dry up, and drop off, leaving the bottom section bare; although the upper portion retains its color and grows until maturity when it blossoms (in the tropics) into yellow tassels. This requires a period of twelve to eighteen months.

Sugar cane is grown to a greater or less degree in all tropical and semi-tropical climates in a great variety of soils. The best soil is that which is rich in nitrogen, potash, and phosphorus and is able to retain a large amount of moisture. It should be well drained and the sub-soil should have enough clay to prevent leaching (percolation) of the soluble constituents. Although temperature requirements

may vary, an annual average temperature of 76° F., as is found in Puerto Rico, is particularly well adapted for the growing of cane. The amount of rainfall and its distribution is a very important factor. Growing cane needs about 80 inches of rain a year. The average annual rainfall in the island varies widely, but in recent years it has averaged about 67 inches. (1). This figure, however, is not completely indicative of conditions, as the northern part of the island has an abundant precipitation and the southern has such a deficiency that irrigation is resorted to in order to provide an artificial control.

Planting.

There are two planting seasons, one of which begins in December and ends in May or June. Cane from this planting is termed Primavera or Spring Planting, and is cut the following year after twelve months. The other planting season begins in June or July and ends in November. This cane is called Gran Cultura or Fall Planting, and is harvested after fifteen or eighteen months.

Before planting the cane the land must be prepared with deep furrows, four feet apart, and drainage ditches. Short sections of seed cane are placed in the furrows and covered with earth. The quantity required differs somewhat; from four to six tons per acre is the usual amount, involving

(1) Puerto Rico Department of Agriculture and Commerce, Annual Book of Statistics (1939), p. 131.

a considerable investment for a plantation of any size. Being a perennial plant, it grows again after being cut. By cutting it close to the ground a stubble, known as a ratoon, is left which is capable, in tropical climates, of producing as many as ten crops. The ratoon crop yields a smaller tonnage of cane per acre than Gran Cultura or Primavera, but as no preparation of land or planting is required it is the most economical crop.

Cultivating.

As soon as the cane is well up cultivation begins. The purpose of it is to destroy weeds and grass and maintain a good soil. Deep plowing is harmful but good growth is aided by occasional moving of the soil to a very shallow depth. Weeding is usually done three or four times before the cane reaches maturity. Several times during the same period fertilizer is applied, but care must be exercised with regard to the type employed. Some kinds of fertilizer tend to produce a heavy tonnage of cane per acre but with a low sucrose content. Other fertilizers may not grow so much tonnage but there will be a proportionately higher yield of sugar.

Harvesting.

After twelve or eighteen months the cane ripens during the cool dry season and is ready for harvesting. In Puerto Rico the harvesting period extends from January to June. The crop is cut by hand; cane cutting machines have

been tried elsewhere but have not been adopted in the island. The cutting is done with a long steel knife called a machete, each man cutting from three to six tons a day, depending on the terrain in which he is working and the thickness of the growth. The cane is cut close to the ground, the leaves stripped off, and the stalks laid in piles. Some cane is loaded onto trucks to be taken directly to the central; while other cane is loaded on ox-drawn or tractor-drawn carts and carried to a field loading station for transfer to a narrow gauge railroad which transports it to the central. Each lot brought to the central is tagged as a means of identifying the colono's farm or company field from which it has come. Upon arrival at the central, it is weighed and the colono or his representative is given a receipt showing the weight of each load. Then each month a settlement statement, showing details of all cane received during that month, is sent to the colono. Similarly, the company keeps records of its own cane (administration cane) by field sections.

Grinding.

Although all centrales follow the same general procedure in grinding their cane, there are minor points of difference among them with respect to certain operations. The description which follows is based on the procedure of the subject central.

After being weighed, the cane is placed on a conveyor belt which carries it into the central to a cutting

machine. This consists of sets of revolving knives which shred the cane into a fibrous condition so that it may more readily be ground. It not only relieves the grinding mills of the work of crushing the whole cane but increases their capacity. No juice is lost in the cutting as it is immediately reabsorbed by the fibers.

The shredded cane then passes successively through a two-roller crusher and three grinding mills; each of the mills has three horizontal rollers so arranged that two of the rollers are placed on a level and are geared to move in the same direction, while the third revolves in the opposite direction. The rollers of the second mill are closer together than those of the first, and the rollers of the third are closer together than those of the second. These rollers turn very slowly and operate under great hydraulic pressure. The juice extracted by the crusher and the first two mills goes directly to be processed; but that which is extracted by the third mill is returned, with some water added, to the cane entering the second mill. This addition of water, called maceration, has as its purpose the dilution of the sugar in the cane so that a higher percentage of it can be removed. The amount added is about 20% of the weight of the cane, and it is estimated that it increases extraction from four to six pounds per ton of cane.

After emerging from the third and final grinding mill the residue of the cane is termed bagasse and is used as

fuel. Once the central has begun grinding and processing, it operates solely on bagasse as fuel. Six tons of wet or three tons of dry bagasse are the approximate equivalent of one ton of bituminous coal. In Puerto Rico its only use is fuel, but in Louisiana it is processed and pressed into sheets of insulating and building board. Experiments have also been conducted with a view to using it as a base for paper but it is not yet commercially successful, as the resulting product lacks strength, has a poor color, and the bleaching of it is too expensive.

Processing of juice.

Upon extraction the juice has a muddy color and contains about 16% sucrose and many impurities. It is first filtered to remove any solid matter. To neutralize its natural acidity and to help settle the impurities, milk of lime is added; after which it goes to the settling tanks to be clarified. It then passes to evaporators, fitted with steam coils, where it is boiled to expel part of the water content and reduce the juice to a syrup.

This syrup is next drawn into boiling pans and boiled until grains of sugar may be seen on withdrawing, with a proof stick, a sample and spreading it on a piece of glass. When this granulation occurs there is a mixture of sugar grains and molasses in the pans which is then ready to be discharged into a centrifuge. This revolves at a speed of 1,200 revolutions per minute and its rapid motion separates

the grains of sugar and the molasses, the latter being thrown through tiny perforations in a copper gauze basket, while the sugar remains in the basket. This is the raw sugar or, as it is sometimes referred to, first sugar. It is coarse in grain and brown in color because of the adherence of a film of molasses. The first run of molasses is rich in sugar and is returned to the syrup for re-processing. The raw sugar is put in heavy burlap bags, 250 pounds to the bag, and is then ready for shipment.

In this processing of raw sugar there are five by-products, or residuals, cane foliage, bagasse, blackstrap molasses, bagasse ashes, and filter mud from the clarifiers which is dried and used as a low grade fertilizer. Industrial chemists are seeking new and more profitable uses for all of these by-products.

Samples of the juice are taken from the crusher for each lot of cane being ground, and analyzed in the laboratory of the central. This analysis ascertains the percentage of the sucrose content, the yield per ton of cane, and the purity. On the basis of this analysis, it is determined what the colono is to receive for his cane, adjustments being made for losses sustained in processing. The laboratory chemists also analyze the various lots of bagasse to find the percentage of sugar unextracted; the molasses to determine the percentage of sugar remaining and the density of the molasses; and the sugar itself to ascertain its polarization. Other analyses

are made to aid in the chemical control of the several operations.

Market for sugar and molasses.

Of the sugar produced by this central during the crop-year 1939-40, 92% was exported to continental United States and 8% was sold in the Puerto Rican market. There were no sales to foreign countries. It is to be observed how closely this conforms to the average for all centrales of 7% for local sales pointed out on page ten.

Of the molasses produced during that same year, 72% was shipped to continental United States and 28% was sold locally. The local sales were principally for distillation into rum and for use as cattle feed.

CHAPTER THREE

RELATIONS WITH COLONOS

In Java and Hawaii practically all of the cane is grown by the same companies which process it. Whereas in Puerto Rico the colono system is similar to that in Cuba, the Dominican Republic, and Trinidad, a large proportion of the cane being grown by independent farmers known as colonos. In common with the other centrales of the island, this company maintains a very close personal relationship with its colonos.

In the earlier days of the industry, when cane fields and mills went together as integral parts of a unit owned by one person, the individual's opportunity for cane cultivation was sharply limited. However, with the development of the modern central, many new growers of cane sprang into existence and, although the great majority of them own less than ten acres of land in cane, they have been increasing in number. In 1940, for example, the Agricultural Adjustment Administration made 11,621 sugar compensation payments in Puerto Rico. This must not be construed to mean that there were quite that many colonos, as this figure also includes some forty payments made to centrales, or closely allied interests, on account of their own (administration) cane. (1).

The colono system has its advantages and disadvan-

(1) Obtained from Sugar Section, Agricultural Adjustment Administration, San Juan Office.

tages for the small farmers, the advantages having been well summed up in the following: (1).

> "Before the modern sugar factory came into existence, cane cultivation was a privilege of the rich. Only those who had sufficient money to establish a muscovado mill, no matter how small, were able to cultivate sugar cane on their own lands. Now even farmers who own only four or five acres of land will cultivate one or two acres in sugar cane, which they sell to the central factories on the same basis as those who cultivate on a much larger scale, the railroad, which forms a part of modern factory layout, having made this possible."

The principal disadvantage is that the colono is more or less bound economically to the central which is nearest to him. As the centrales are scattered throughout the island, they cannot usually be considered to be in a competitive position as regards colonos. Transportation expenses are a big deterrent to the colono who might wish to transfer his cane to another central. In previous years the central had the advantage, as far as relative bargaining ability was concerned. To-day, however, that has been altered considerably by legislation favoring colonos, and through the organization of colonos into groups, giving them the benefits of collective bargaining.

Some colonos cultivate their own land, some are cash tenants, and some are share croppers. In the case of the last two, the central or some individual may be the land-

(1) Bird, Jorge, <u>The Economic Factors of the Central Sugar Mill</u>, (The Book of Puerto Rico), pp. 541-43.

lord. In some instances there are colonos who raise cane in more than one of these categories at the same time. As a result, there are extremely varied relationships existing between them and the central.

Colono contracts.

These relationships are best exemplified in the contract between the colono and the central, the two most important parts of which (those pertaining to crop loans and methods of payment for colono cane) are treated separately in the next two sections. This agreement, formally designated as a "Contract for the Planting and Cultivating, Grinding and Financing of Sugar Cane", sets forth the terms on which the central will buy cane from the colono, make advances to him, and carry out all the details appurtenant to the financial and agricultural relationships between the colono and the central. The more important provisions of the contract which is in effect at the present time between the subject company and its colonos are considered in this section.

The contract is uniform in its conditions as to all the colonos of the company, the only difference being in the length of time each contract has to run. Nearly all of the contracts are made for a term of one year; those which are not on a one-year basis are scheduled to operate for a period of five years. A year in these instances is understood to mean a crop-year, rather than a calendar year.

It includes an estimate of the total production of

the colono, which it is anticipated will be delivered to the central. Since the adoption of the Agricultural Adjustment Administration program this is equivalent to the quota allotted the individual farmer. The assigned quota of each is stated in tons of raw sugar and, since the yield of cane per acre and the extraction per ton of cane is not definitely known until the time of harvesting and grinding of the cane, it becomes necessary to estimate as carefully as possible the cane required to fill the quota of the colono. At harvesting time, his daily deliveries to the central are closely watched and, when they begin to approach the limits set by the quota, he is advised of the remainder needed to complete his quota allotment. Minor excesses and deficiencies are offset among the colonos of the central, as long as the total quota of all is not exceeded.

In the event that the quotas are subsequently suspended temporarily (as they were in the latter part of 1939) or permanently, provision is made for consultation between the colono and the central in order that an agreement may be reached between them as to the amount of cane to be ground.

There are certain varieties of cane which the central requires the colono to plant if they are to be accepted for grinding. The colono is not permitted to employ fertilizer other than the kind authorized by the central. The company is specifically given the right to inspect the farm or plantation of the colono at any time. The colono must not

cut his cane until it is fully matured and the cutting has been authorized by the central. It is stipulated that it be cut in sections with a maximum length of three feet and must be delivered to the central free of trash, dirt, and foliage. At first glance it might appear that all of these provisions distinctly favor the central; but it should be noted that the latter, with its broad background of experience in both the raising and processing of cane, is usually in a better position than an individual colono to know how the maximum results and yields may be obtained. Also, because of the mutual desire to produce cane of a high yield, it is to the interest of both grower and company for the former to conform to the requirements outlined above.

The colono agrees to sell his cane to the central. This provision definitely makes the contract one of purchase and sale. This is also reflected in the fact that once the cane has been delivered to the central, it has complete control over it and has all rights to the residual income. In effect, the contract is an advance sale by the colono to the central without a fixed price. In lieu of a definite price for the colono's cane, a formula is provided as a basis for the division of the proceeds from the sale of the sugar between the colono and the central.

The colono is required to send to the central the daily quantity of cane assigned. This is essential if the central is to maintain continuous operation once the grind-

ing has begun. A schedule of all deliveries is prepared weekly in advance and copies are given to the superintendent of cultivation who is in charge of the administration cane, the laboratory chemists, the weighing clerks, and the railroad traffic supervisor. Usually the colonos are given the same place on the schedule which they held the previous season. This enables them to begin their harvesting about twelve months from the time their cane was cut the preceeding year.

It is agreed that the colono is to bear the costs of planting, fertilizing, cultivating, harvesting, and transporting to the central's railroad loading station, if there is a railroad track near his farm. When it has been delivered to the railroad, the company bears the transportation costs from there to the central. If he delivers his cane by truck directly to the central, he bears the expense of such transportation but is subsequently reimbursed by the central, at the rate of ten cents per ton of cane for each kilometer up to five; when the hauling distance is greater than five kilometers, payment is made at the rate of fifty cents per ton. If it so wishes, the central has the right to lay portable railroad track in the fields of the colono.

In case a fire has accidentally burned any cane, preference is to be given to that cane in the grinding schedule. It does not mean that the burned cane is unfit for use, but merely that it should be processed immediately as it is

subject to rapid deterioration.

In the event of breakdowns in the transportation system or grinding equipment of the central, which would not permit the grinding of any cane for a period in excess of ten days, the central may require the colono to send his cane to another central. In such case, the colono has to resume his deliveries of cane to the subject central when the necessary repairs to the transportation system or grinding equipment have been effected. The proceeds arising from the cane transferred to the second central revert to the original central to be applied against any indebtedness of the grower. If the breakdown can be remedied within ten days the central notifies the colonos at once to cease harvesting temporarily.

The central sets its grinding season from the month of January to the month of June, inclusive. It does, however, reserve to itself the right to advance or retard this season when, for any reason, it deems it advisable.

While the contract is in effect, the colono is not permitted to sell, donate, or mortgage his land or the cane thereon, unless the third party accepts all of the conditions of the contract.

If any local or insular tax is imposed either on cane or sugar, on the product or its manufacture, directly or indirectly, an equitable portion is to be borne by the colono.

The central reserves the right to pay to the Insu-

lar Government any indebtedness of the colono to that body politic arising from taxes levied upon the colono's land or cane subject to the present contract. Any payments made in this way are to be charged against the colono in the settlement between him and the company. This provision is inserted so that the central may forestall the imposition of any tax lien upon the cane delivered and have a title which is free and clear.

Subsequent orders, rules, and regulations which the central may promulgate in connection with the planting, cultivating, cutting, transporting, grinding, and purchasing of its colonos' cane are to become an essential part of the contract.

If the proceeds of the colono's cane ground by the central during the current season are insufficient to meet his indebtedness to the company, the amount of the deficit will be considered as the first advance on his crop of the following year. If the contract has already expired under its present terms, the central has the right to extend it for another year in all its conditions. In practice, such a deficiency seldom occurs.

It is also agreed that both parties will be bound by any subsequent rulings of the Agricultural Adjustment Administration and the provisions of any future legislation which pertains to the relationship between mill and grower.

The general effect of all these provisions is to

subordinate the colono to the central, but it does not necessarily impose the hardships upon the former which it might appear to. There is a very great mutuality of interest in the subject matter of the contract, as a result of which both the central and the colono find their interests largely indivisible.

Crop loans.

As previously pointed out, the great majority of colonos are small farmers tilling less than ten acres and, like farmers everywhere, operating to a large extent on borrowed capital. There is a period of at least twelve months between the time of planting and harvesting their cane and, during that time, there are a number of expenses to be paid, for fertilizer, feed, labor, taxes, etc. Lacking adequate working capital of their own, they make a practice of borrowing from the central to which they take their cane to be ground. This borrowing takes two forms; one consists of direct cash advances and the other represents the central's endorsement of colonos' promissory notes, issued to fertilizer dealers, to cover the purchase of fertilizer by the colonos. This latter, of course, constitutes a contingent liability in the form of a guaranty on the part of the central. In a few cases cash is advanced by the central to colonos in anticipation of Agricultural Adjustment Administration benefit payments which will later accrue to the colonos.

Although most of the colonos avail themselves of the

extension of credit by the central, there are some who borrow elsewhere, either from commercial banks, private sources, or Federal lending agencies. The extent of such outside borrowing is not definitely ascertainable, but that it is slight is indicated by the fact that as of December, 1940, the records of the San Juan Office of the Emergency Crop and Feed Loan Section of the Farm Credit Administration showed only 754 loans, aggregating $175,260, made to Puerto Rican sugar cane growers. This is an average loan of $232.44. (1). Studies made in previous years support this same conclusion, indicating little change in the status of this type of borrowing. (2), (3).

In the case of those who borrow from other sources for cultivation expenses, the outside credit grantor may arrange with the central to make advances for harvesting expenses, at a certain rate per ton of cane delivered, to be guaranteed by the former. The central deducts these advances from the monthly settlement with the colono and remits the balance due to the outside creditor of the colono. This is done as a convenience for both the grower and the outside lender.

(1) Obtained from agency mentioned.

(2) Gayer, A.D., Homan, P.T., and James, E.K., The Sugar Economy of Puerto Rico, (New York, 1938), p. 145.

(3) Bird, Esteban, The Sugar Industry in Relation to the Social and Economic System of Puerto Rico, (Puerto Rico Reconstruction Administration, 1937), p. 82.

The central has powers of supervision and control over the colono and his cane which other lending entities do not have or, at least, do not generally exercise. In addition, the central is able to repay itself from the proceeds of the colono's cane. These somewhat unique circumstances have tended to concentrate the lending to colonos in the central and, at the same time, to make private sources of credit more or less averse to making loans to colonos. If the colono is not to lose money on his crop, it must be cut when it is in the best condition and ground immediately. It has been intimated that the central might be more concerned with grinding the cane of colonos in whom they are financially interested, than with grinding the cane of colonos who have borrowed elsewhere. This statement might well be questioned because the central, after all, is interested in producing sugar as efficiently as possible and, to this end, is desirous of obtaining the maximum quantity of sugar from all cane, regardless of its origin. The relationship between the central and the colonos being what it is, it would seem to be a perfectly natural sequence that most of them make their borrowing arrangements with the central.

During the crop-year 1939-40 this company made cultivation loans to 212 colonos out of a total of 330 with whom it had contracts. This is 64% of the total number of colonos, but is not necessarily indicative of the number of them in debt because it is not definitely known how many had credit

extended to them by other sources. During the grinding season, however, all colonos received advances for cutting and transporting their cane. The greatest number of cultivation loans were outstanding during the period from July to January, and the smallest number in the month of June. It is readily seen that the loaning activity follows the crop cycle very closely.

The advances for cultivation are usually made in instalments, as needed, until they reach $1.50 per ton of cane allotted under the quota system. To obtain these periodic advances, the colono must make a detailed report of the extent of his work done up to that time. Payment is approved after careful inspection of the colono's land by a company official, designated inspector of colonos. It is not known in advance exactly what the tonnage of cane will be for each colono, but it can be roughly determined on the basis of acreage and yield. Advances for harvesting expenses are made up to $1.25 per ton of cane delivered.

Inasmuch as the costs entailed in planting and cultivating gran cultura cane are greater than those for primavera; and the costs of primavera are greater than those for ratoons (which do not have to be planted at all); special arrangements are made by the colono planting gran cultura or primavera cane with the central. He prepares an expense budget which is approved by the central and, on the basis of it, advances are made which are somewhat in excess of the

$1.50 per ton noted above for regular cultivation expenses.

In the peak month of January, 1940, loans outstanding aggregated $83,521, but in the low month of June, 1940, had been reduced to $31,379. This latter amount is higher than a normal June balance because there was a quantity of inventory quota sugar remaining unsold at that time and, consequently, no proceeds had been received on it to apply against loans outstanding. About $5,000 or $6,000 would be a normal balance for that time of year. The balance in June ordinarily represents advances for new planting and ratoon cultivation for the following season. On the basis of the maximum amount advanced to all colonos, the average loan in this year was about ~~year~~ $400. This average, of course, disregards the size of the colono's cane acreage or tonnage.

All crop loans are settled out of the proceeds of sugar sold, the colono receiving from the central any balance remaining to his credit. They are generally settled in the first few months of the grinding season. In the infrequent event that the proceeds are inadequate to cover the balance of the loan, it is carried over to the next season. The central does not usually hold any mortgage on the colono's land.

At the present time the company is charging 8% on all of its loans to colonos. On the funds which it obtains for relending from the banks, it is currently paying 7%, leaving a margin of 1% to cover all expenses of administration.

In Puerto Rico the legal rate of interest, that is, the rate which the law applies in the absence of a specific agreement, is 6%. The lawful rate of interest, or the maximum rate which the law permits, is 9% on loans under $3,000 and 8% on loans over that amount. Writing in 1938, when most centrales were charging 8% and 9%, Messrs. Gayer, Homan, and James found that, (1)

> "By mainland standards of to-day, rates of interest in Puerto Rico are decidedly high; but whether, as is commonly complained, the rates are 'exorbitant' in view of all the circumstances, and especially in comparison with the rates currently charged by the banks on loans to colonos and on first mortgages on agricultural land, is open to question."

Although there are no data available to show whether an actual profit is made, or loss incurred, by the central on this loaning activity, it is highly probable that any profit which results is small.

This type of loan is usually a particularly conservative one for the central to make, as is borne out by its recent loss experience; in the space of the last ten years it has incurred no losses on colono loans. An extraordinary situation which existed prior to that time is commented upon in Chapter Five.

While discussing this matter of colono loans, a rather unusual situation should be pointed out. The United

(1) Gayer, A.D., Homan, P.T., and James, E.K., The Sugar Economy of Puerto Rico, (New York, 1938), p. 145.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

States Department of Agriculture, working through the Farm Credit Administration, has set up in Puerto Rico a branch of the Emergency Crop and Feed Loan Section. This agency makes loans to the smaller colonos in amounts up to $400 and accepts as collateral for the loan a first lien on the colono's crop. When a colono applies to it for a loan it checks his quota with an official list, makes the usual credit investigation which a commercial bank might be expected to make under similar circumstances and, if it accepts, is prepared to loan a maximum of $20 per ton of sugar (based on estimated yield) or $55 per acre, whichever is lower. The agency makes no attempt to exercise the powers of supervision over cultivation which the central reserves to itself when colono loans are made. As the result of a three-party arrangement, the central consents to pay the agency the balance due it before making settlement with the colono.

Its current rate of interest on this type of loan is only 4%, or one-half the rate charged by the central, and yet it has on its books only eleven loans, aggregating $2,550, to colonos of the subject central at this time. These eleven are scarcely more than 3% of the total number of the company's colonos. Although the facilities of this agency are available throughout the island, the same situation obtains for the island as a whole. On the 1940 crop it made loans to 754 Puerto Rican colonos, representing only about 6% of the total colonos, and a large number of these were the colonos of one cen-

tral which operates on a cooperative basis. The agency's interest rate is exceptionally low, not only by comparison with the company rate of 8%, but also by comparison with the current rates of 8% and 9% charged by commercial banks on sugar loans. The agency's credit requirements are not difficult to meet, and with the low interest rate, it is puzzling why it is not more widely used by colonos. When questioned on this point, a representative of the agency stated that it was largely due to the fact that the agency was not permitted to advertise itself in any way and that those colonos who knew of its services but continued to borrow from the centrales, did so through long established custom. It would also appear that the $400 maximum might limit its usefulness to the smaller colonos only.

Method of payment for colono cane.

When the colono signs his contract with the central he agrees to sell his cane to the latter but, as previously noted, at an unspecified price. Even when his crop has been harvested and delivered to the mill, the price he is to receive remains uncertain. The contract does not specify any price but it does specify the means by which the price may be determined. Speaking broadly, the price is based on two variable elements - the market price of raw sugar and the yield of the cane. The basis used in setting up the formula for this payment is the most significant part of the entire contract and has always been the most moot question to

be settled by grower and company. On it largely rests the answer as to whether the colono is to make or lose money on his crop. The question is, "How are the proceeds of the sugar to be divided between central and colono?" Naturally, there is present a conflict of interest, whose outcome has always been determined by bargaining. The share of each party has never been set according to the needs of that party; although in previous years when the share of the colono was less than it is to-day, it was argued that the colono, who incurred 72% of all costs of producing sugar but received only 57.4% of the yield, was being shamefully treated. (1). The point at issue was more of a social-economic question than a purely economic one. Probably the share of the colono was smaller than it should have been but, in any event, since that time the colonos have become organized and legislation has been passed which states the minimum percentage which the colono is to be paid, the basis for the formula to be used, and other related matters.

Before proceeding with the discussion of the method used by this company and the requirements of the law, let us summarize the various methods which are, or have been, used by sugar companies. (2).

---

(1) Bird, Esteban, The Sugar Industry in Relation to the Social and Economic System of Puerto Rico, (Puerto Rico Reconstruction Administration, 1937), p. 78.

(2) Moberly, G.S., Proceedings of the International Society of Sugar Cane Technologists, (Fifth Congress, 1935), pp.134 ff.

"1. Payment for each ton of cane delivered, of a price proportional to the value of sugar. This is a very primitive method, as it takes no account of the quality of the cane. The same price is paid for wood and water as for sucrose. Although not extinct, it can be considered obsolete.

2. Payment for each ton of sucrose in the cane (modified by various other factors), of a price proportional to the value of sugar. This is an improvement on Method 1, but does not consider directly the amount of sugar recoverable from the sucrose, though arbitrary modifications of the sucrose are made to correspond roughly with this. This is the present method in South Africa.

3. Payment for each ton of sugar estimated to be recoverable from the cane delivered, of a price corresponding to the value of sugar. This is still a further advance on the previous method. It is the method in use in Australia.

4. Payment for each ton of sugar estimated to have been actually recovered from the cane delivered, of a price corresponding to the value of sugar. This is the commonest method in vogue in most parts of the world."

Method 3 is the one employed by the subject company and is to be discussed more in detail.

About forty years ago the sugar recovered from cane averaged 10% or less of the weight of the cane, and at that time it was customary for the centrales to pay the grower at the rate of five pounds of raw sugar for one hundred pounds of cane. Since the total recovery was ten pounds and, of this, five pounds were given to the grower, he was paid 50% of the yield. During the intervening years, however, the

rate of payment to the colono has been increasing, as has also the percentage of recovery.

The law (1) in effect at the present time requires the central to pay the colono 65% of the yield of the cane, when the yield for that central during the previous period of two weeks or one month was in excess of 12%; if the yield during that period was less than 12%, the central is to pay the colono at the rate of 63%. It is also provided that if the cane delivered during the fortnight or month produced a yield of less than 9%, the colono and the central are left free to determine what their respective percentages will be. As an indication of how this works out in practice, the average yield of this central for the 1939-40 crop was 12.15%, which was somewhat above the combined average of all Puerto Rican centrales for that same year. Although this law generally improved the lot of the colonos, one part of it may conceivably discriminate against some of them. For example, assume that during a month when the average yield of all cane ground was less than 12%, the cane of one or more colonos was actually yielding more than 12%; in that case they may be inequitably treated, for the law provides 63% as the colono's share when the average yield is below 12%.

Settlement is required to be made at least every month and the basis for the value of sugar is stated to be

(1) Law 112 of May 13, 1937, as amended by Law 213, May 15, 1938.

the average New York Market price of raw sugar (96°) for the period in which the cane has been delivered. From this average the central is permitted to deduct the cost of bags, marine insurance, freight, commissions, insular taxes on sugar, and any other expense related to the sale of the sugar in the New York Market. These deductions, however, are not to exceed 25 cents per hundredweight of sugar.

The settlement is generally made in cash, after the central has provided for the payment of any indebtedness to it. The contract may legally provide for the colono to receive his proceeds in sugar if he so desires but, if this is done, he is not to receive more than his share of the export and local market quota assigned to him by the Agricultural Adjustment Administration.

This system of liquidation, based on yields above and below 12%, is designed to reward cane of good quality and penalize cane of an inferior grade, and acts as a stimulant in improving cane quality. The following statement by an officer of another sugar company furnishes the theory on which the 63%-65% payment is based: (1).

> "1. Juices from canes of low sucrose content and purity are difficult to clarify, and a larger portion of the sucrose contained in such juices is lost in the process of manufacture than in the case of juices from high-quality canes. Therefore, the

(1) Quoted by Gayer, A.D., Homan, P.T., and James, E.K., The Sugar Economy of Puerto Rico, (New York, 1938), pp. 139-141.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

"colono's share of the sucrose in juice (or cane) must be lower than in the case of good canes. Experience is the only guide.
2. The costs of railroad transportation, handling, and milling are the same, per ton of cane, for poor canes as for good canes, - and the resulting costs per ton of sugar recovered are considerably higher in the case of poor canes. As these costs are all borne by the mill, it seeks to recoup a part thereof by the retention of a larger percentage of the sugar recovered from poor canes than it retains in the case of good canes."

The yield of the cane is determined in the laboratory of the central by chemists. Prior to the enactment of the present law, the colonos frequently complained not only about the percentage they were to receive, but also about the way in which the yields were determined by the laboratory employees of the company, over whom the colonos had no control or check. They had no way of knowing whether they were being fairly treated and might harbor suspicions, whether justified or not. The formulas used in ascertaining the yield varied widely among the various centrales and there was considerable agitation for the use of a standard formula which would not be too complicated.

Without presuming to discuss the technical merits or demerits of them, two formulas, either of which may be used, are prescribed by the law. In the application of them the chemist must take a continuous sample, of not less than three minutes duration, of the juice derived from the first extraction by the crusher for each car, truck, or wagon of

cane delivered to the mill. Formula 1 states that $R = (S - .3B) F$, where R is the yield of 96° sugar, S is the polarization of the juice, B is the density of the juice, and F is an experience factor based on average values of R, S, and B during the month in which the colono's cane has been ground. Formula 2 states that $R = FS$, where R, S, and F are respectively the same as noted for Formula 1. This company uses Formula 2 as best suited for prevailing conditions.

The law gives the colonos the right to designate a representative with the necessary assistants in the laboratory and the weighing stations of the central to observe and take part in the weighing of the cane, testing of the scales, sampling and analyzing of the juice, and carrying out all functions pertaining to the calculation of sugar in process at any period of the grinding season. The colonos of this company actually make use of these privileges and, as a group, share the expenses of maintaining these representatives. The company is required to grant access to these men to the departments involved and provide them with all reasonable facilities for carrying out their duties. The subject central complies fully with these provisions, realizing that these arrangements have done much to place colono relations on an improved basis and to eliminate any possibility of the old suspicions.

The law also sets up a board of arbitration to settle any disputes which may arise between colonos and central.

The board consists of the Commissioner of Agriculture and Commerce and six members appointed by the Governor of Puerto Rico, three of whom are representatives of the sugar companies, and three are colono representatives. The Insular Inspector of Chemical Laboratories serves the board as technical advisor.

CHAPTER FOUR

PRODUCTION AND YIELDS

In an earlier part of this study the development of the sugar industry in Puerto Rico and its annual production of raw sugar were traced. In this chapter it is proposed to survey the increases in yields which have taken place, the agricultural and technological improvements which have made them possible, and the production record of the subject company. The discussion of yields will be somewhat circumscribed by the fact that records for the island as a whole go back only to the 1916-17 crop, and that prior to 1928 this company was grinding colono cane only, for which no detailed data are available. In 1929 the company planted its first small quantity of cane and each year thereafter increased its acreage to the amount cultivated to-day. Because the administration acreage for the first few years was small, no data on it will be presented here.

In 1939 Central Vannina, Inc. was dissolved and succeeded by two separate entities. One of these (Sociedad Agrícola de Río Piedras, S. en C.) functions as a partnership, owning and operating the cane land formerly owned by Central Vannina, Inc. The other (Central San José, Inc.) is organized as a corporation which owns and operates the mill and the railroad equipment previously owned by Central Vannina, Inc., but it does not own any land used for agricultural purposes. It should be understood that wherever any data re-

garding the 1939-40 crop of cane are used, they pertain to the successor partnership and are used here for purposes of comparison or to bring the record up to date without interruption.

Yields.

There are various ways of portraying the yield of sugar cane. By taking into account the acreage of cane harvested and the tons of cane obtained, one can secure the yield stated in tons of cane per acre. By considering the tons of cane ground and the tons of sugar derived from that cane, the extraction, stated either as a percentage or in tons of cane per ton of sugar, can be determined. A third method computes the tons of sugar per acre of cane; the result by this method is a composite of cane yield per acre and sugar extracted from that cane. It should be mentioned here that in much of the following exposition the unit of land measurement is the cuerda but, inasmuch as a cuerda is .974 of an acre, it is for practical purposes the same as an acre and is so dealt with.

The production of sugar cane has increased over the years but not as rapidly as the production of the raw sugar itself, due to improvements in the grades of cane, as well as in methods of grinding which have resulted in a higher recovery of sugar from the cane. Due to variations in rainfall and other climatic conditions, the year by year figures of cane production show certain fluctuations. In order to

present a fairer picture of the improvements which have taken place, five-year periods are averaged in the following summary which covers all of Puerto Rico: (1).

Crop Period	Tons of Cane Per Acre
1917-21 (a)	20.3
1922-26	19.0
1927-31	25.1
1932-36	27.9
1937-40 (b)	29.3

(a) Average for four crop-years. Data for 1917-18 not available.
(b) Four-year period.

The yield of cane for the 1937-40 period represents an increase of 44% over the 1917-21 period. This result is directly attributable to the experimental and research work which has been carried out by the larger companies and the agricultural experiment stations. It must be borne in mind that these improvements represent the increase for the island as a whole, and that in some individual instances the yield has increased much more than the above figures would indicate.

Sugar cane is susceptible to various types of diseases and the development of types of cane which will be disease resisting has been a major problem of the research men. In the summary above, the decline which occurred in the 1922-26 period was principally due to the ravages of disease. With the eradication of it by the introduction of new types of cane, the upward trend was resumed, as shown by the

(1) Based on data obtained from the Association of Sugar Producers of Puerto Rico.

averages for the periods beginning with 1927-31. That the end has not yet been reached in the way of improved varieties of cane, is evidenced by the fact that the men of research are still engaged in the quest for better strains of cane through breeding.

Since 1929 the company has obtained its cane partly from colonos and partly from its own land. Comparative yields are available only for the last three years and are shown in the following table:

Crop-Year	Colonos: Acres Harvested	Colonos: Tons of Cane	Colonos: Tons Per Acre	Company: Acres Harvested	Company: Tons of Cane	Company: Tons Per Acre
1937-38	2,577	59,746	23.2	4,180	92,415	22.1
1938-39	2,708	55,186	20.4	2,505	65,615	26.2
1939-40	2,900	66,937	23.1	3,151	76,794	24.4

These results are for too short a period to be indicative of any trend. For this period the average number of tons per acre for colono cane was 22.2, and for company cane was 23.9, or a combined average of 23.1. The comparatively low yield for both colono and company cane is chiefly due to the absence of irrigation and the general inferiority of their land to other cane lands of the island. Irrigation is not practiced in this area because the terrain, mostly broken and hilly, does not lend itself to it.

This is somewhat at variance with the yield experience which obtains for the island as a whole. Usually the yield per acre for company land exceeds that of colono land by a wider margin than is the case here. The reasons ad-

vanced for this are that the quality of company land is generally superior, and that the companies employ more efficient agricultural methods. Current figures are not available to support this statement, but a previously quoted study found that in 1934-35, Puerto Rican colonos cultivated 48.7% of the total sugar cane land but produced only 35.5% of the total sugar cane; the centrales, cultivating 51.3% of the sugar cane land, were producing 64.5% of the total cane. (1). The Department of Agriculture and Commerce publishes annual statistics purporting to show, by centrales, the tons of colono and company cane ground; but the amounts for colonos include, to an extent not readily determinable, cane grown by companies or persons allied with the centrales.

The company maintains records showing yields on its land of different cane plantings. As an indication of how these may differ, the following averages for the last five years are cited here:

	Tons of Cane Per Acre
Gran cultura (about 18 months from original planting)	34.55
Primavera (about 12 months from original planting)	28.33
Ratoons (not the original crop)	20.72

Varying results as to yield are shown also according to the variety, or species, of cane. For example, the following general averages (including gran culturas, prima-

(1) Gayer, A.D., Homan, P.T., and James, E.K., The Sugar Economy of Puerto Rico, (New York, 1938), p. 78.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

veras, and ratoons) of the company were recorded for the 1937 crop:

Variety of Cane	Tons of Sugar Per Acre
Mayaguez 28	3.51
P.R. 803	2.74
P.O.J. 2878	2.73
Santa Cruz 12-4	2.58

What variety of cane to plant is a question for each central and colono to decide on the basis of experience, either their own or that of someone else.

The second method of determining the yield of cane consists of computing the amount of sugar extracted from a given quantity of cane. The result is usually stated either as a percentage or in tons of cane per ton of sugar. In the following summary, showing island averages for five-year periods, this result is given on both bases: (1).

Crop Period	Tons of Cane Per Ton of Sugar	Percentage of Sugar Per Ton of Cane
1917-21 (a)	9.90	10.10
1922-26	9.14	10.94
1927-31	8.74	11.45
1932-36	8.32	12.02
1937-40 (b)	8.26	12.10

(a) Average for four crop-years. 1917-18 not available.
(b) Four-year period.

Although the annual figures are subject to fluctuation, these five-year averages show an uninterrupted trend of improvement in the yield of sugar. This can be ascribed to two general

(1) Based on data obtained from the Association of Sugar Producers of Puerto Rico.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

factors: an increasingly higher sugar content of the cane grown and more efficient recovery methods on the part of the central.

By way of comparison with these figures, the yields of the company for the past eight crop-years appear in the following summary:

Crop-Year	Tons of Cane Per Ton of Sugar	Percentage of Sugar Per Ton of Cane
1932-33	9.07	11.03
1933-34	8.23	12.15
1934-35	10.22	9.78
1935-36	8.41	11.89
1936-37	8.22	12.17
1937-38	8.10	12.35
1938-39	7.84	12.75
1939-40	8.23	12.15

The poor showing of 1934-35 was mainly due to Agricultural Adjustment Administration restrictions which prevented all of the crop being ground for sugar; a large part of it was processed only for cane syrup and rich molasses. The crop-year 1939-40 was one of adverse climatic conditions, reducing yields generally throughout the island. The average percentage of extraction for all centrales in that year dropped to 11.58%. (1).

No data similar to that given above are included here for the yield method which states the number of tons of sugar per acre of cane; this method, being a composite of the other two, would merely repeat what has been already

(1) Obtained from the Association of Sugar Producers of Puerto Rico.

stated.

It has been maintained by many that better yields and results can be obtained when both the growing and the processing are controlled jointly. With reference to this, the Brookings Institution made this observation: (1).

> "From a strictly technical standpoint, sugar can be produced more efficiently and cheaply where both cane growing and sugar manufacturing are under a single administration. . . . One of the world's leading sugar experts, whose personal studies cover a majority of the great cane-growing countries, enumerates among the reasons why planters in Java and Hawaii obtain over five tons of sugar per acre the fact that 'in both countries the field as well as the factory is under complete control of one and the same manager and his staff.' "

Although they are not strictly to the point, the figures presented below indicate what the situation in Puerto Rico was for the crop-year 1934-35, the latest year for which such data were prepared. (2). Although these figures may serve to measure relative yields, they should not be considered normal on an absolute basis; it was in that year that yield data were upset through some of the cane being ground only for cane syrup and rich molasses. It should be borne in mind, too, that the company farms are in the group of larger farms.

(See following page)

(1) Clark, Victor, et al, Porto Rico and Its Problems, (Brookings Institution, Washington, 1930), p. 620.

(2) Sugar Section, Agricultural Adjustment Administration, August 24, 1936.

Cane Acreage of Farms	Tons of Sugar Per Acre
Under 2	2.41
3 to 10	2.77
11 to 25	2.89
26 to 100	3.39
101 to 200	3.43
201 to 500	3.93
Over 500	4.43
Average for all	3.33

This summary plainly denotes a wide range of yields, from 2.41 tons per acre for the smallest size farm to 4.43 tons per acre for those in the largest size group, the latter having almost twice the yield of the former. It is important to note that the yield follows a constant line of increase from the small farm to the large. As the average yield has increased since 1935, it is likely that the yield of each group has also increased, but to an unknown extent.

Production.

The statement was previously made that the great majority of colonos are small farmers. The extent to which this is true, both as regards the company and the island as a whole, is shown in the following table: (1).

(See following page)

(1) Sugar Section, Agricultural Adjustment Administration, San Juan Office.

1939-40 Frequency Distribution of
Cane Marketed or Processed, By Farms

	Puerto Rico				Company			
Tonnage Interval	Number of Farms	% of Total	Tons of Cane	% of Total	Number of Farms	% of Total	Tons of Cane	% of Total
100	6,236	53.6	254,197	2.9	156	47.3	7,009	5.0
300	3,210	27.6	558,847	6.4	141	42.8	21,400	15.2
500	793	6.8	301,209	3.4	12	3.6	4,637	3.3
1,000	625	5.4	429,695	4.9	8	2.4	5,348	3.8
2,000	367	3.2	508,420	5.8	9	2.7	12,654	9.0
3,000	112	1.0	270,339	3.1				
4,000	60	.5	207,157	2.4	1	.3	3,118	2.2
5,000	55	.5	241,838	2.7	1	.3	4,414	3.1
10,000	84	.7	585,207	6.6	1	.3	5,262	3.7
15,000	22	.2	268,693	3.1				
20,000	12	.1	193,919	2.2				
25,000	11	.1	235,941	2.7				
30,000	2)		51,237	.6				
40,000	5)	.1	172,383	1.9				
50,000	4)		187,023	2.1				
75,000	5)		292,328	3.3				
100,000	7)		569,744	6.4	1	.3	76,794	54.7
150,000	5)		611,403	7.0				
200,000	)							
300,000	)	.2						
400,000	3)		983,440	11.2				
500,000	)							
Over)	)							
500,000)	3)		1,873,212	21.3				
Total	11,621	100.0	8,796,231	100.0	330	100.0	140,636	100.0

The total tons of cane for Puerto Rico do not check with a computed total for that column due to the dropping of decimals. Neither do the tons of cane for the company quite agree with the figures for the company used elsewhere in this study, as this table was prepared from data of the Agricultural Adjustment Administration which are compiled on a slightly different basis.

Examining first the figures in the table for the company, it is demonstrated that those farms which supplied

less than 300 tons of cane each, accounted for 90% of the total number of farms but produced only 20% of the total cane. One farm, formerly the company's own, produced nearly 55% of the total cane.

The same pattern of results is shown in the tabulated figures for Puerto Rico, where all of the farms which supplied less than 300 tons of cane each, accounted for 81% of the total number of farms but only 9% of the cane. 23 farms, each of which produced over 50,000 tons, and representing .2 of 1% of the total number of farms, accounted for 49% of the cane for the entire island.

This serves to illustrate beyond question the concentration of cane production in relatively few farms, and its dispersion among a large number of small farms. This condition, and its denomination as a "social evil", should be kept in mind as one of the causes for legislation regarding land holdings.

The output of raw sugar of the subject company for the last fourteen years has followed a rather irregular course, as evidenced by the following figures:

Crop-Year	Tons of Sugar Produced	Crop-Year	Tons of Sugar Produced
1926-27	11,170	1933-34	19,521
1927-28	10,188	1934-35	12,374
1928-29	9,731	1935-36	12,578
1929-30	14,690	1936-37	16,489
1930-31	11,605	1937-38	18,794
1931-32	15,298	1938-39	15,406
1932-33	10,792	1939-40	17,469

During the last five years the sugar produced by the company has varied from 1.4% to 1.8% of the total production of the island. Several hundred thousand gallons of molasses are annually produced as a by-product, one ton of cane yielding four or five gallons; but because of its small value, the molasses provides a relatively minor proportion of the total income. However, molasses may become more valuable in the future, as chemists have found that its composition is similar to that of coal tar, and they are endeavoring to produce from it some of the many derivatives which are at present obtained from coal tar.

The most important single event of recent years for this company, and all sugar companies, was the creation of the Agricultural Adjustment Administration and the restrictive quotas imposed by it. A more complete discussion of this appears in Chapter Seven, but it is pertinent to mention briefly some consequences of it at this juncture. The company's own cane crop has, perforce, been reduced more than 30%, in order to conform to quota requirements. There has also been a substantial increase in the number of colonos supplying cane to the company. The reduction of the company cane has been the result of two factors: the limitation decreed by the legislation itself, and the distribution of the quota for the mill area over an increased number of colonos. To compensate for this sacrifice on the part of the company, the Agricultural Adjustment Administration program provides

[illegible]

[illegible]

cash benefits for it.

Basis of improvements.

The improvements which have taken place in yields have already been noted, but some consideration will now be given to the reasons for such improvements. For the most part, they are technical in their nature and it would be presuming to include a complete discussion of them within the scope of this study. Some of the more important developments will be briefly surveyed for the light they may throw on the first part of this chapter.

There are certain plant diseases which attack sugar cane with varying results. One of the worst of these is the mosaic disease which appeared in Puerto Rico in 1915 and spread until it had revealed itself in three-fourths of the island. Its effect was to stunt the growth of the cane and produce a yellow mottling of the leaves. (1). Intensive research on the part of the sugar industry and the agricultural experiment stations was instituted in an effort to overcome this and other diseases threatening the cane. Their first work in this direction was along the line of mechanical control by such methods as farming practices, fertilizers, and chemicals. (2). It was not until later that the possibility of introducing a disease-resistant cane was realized. By 1919 it was

(1) Chardón, C.E., The Journal of the Department of Agriculture (P.R.), (July, 1927), pp. 12-13.

(2) Annual Reports, Porto Rico Agricultural Experiment Station, (1922), p.2; (1923), p. 1.

conclusively established that a variety known as Uba was immune to the mosaic disease. (1). It was an emergency cane and, as such, served well to fulfill its purpose of overcoming mosaic. The disadvantage of it was that it was a cane of low juice content and undesirable milling qualities. The growers were tempted to turn to canes of greater yield, but many who did were again beset with the troubles of mosaic.

In the course of this research a great many different varieties have been produced or introduced with diverse results; but two varieties have been found which almost completely overcome cane diseases and, at the same time, have much higher yields than the old canes. The mosaic disease has been properly referred to as a blessing in disguise for having brought about

> "a rational change in the cultivation and improvement of a crop. It has been . . . an education, for now every colono in the island has awakened to the fact that, after all, only science applied to crop production can in the end solve his problems." (2).

As an example of what has been done and is being done, the University of Puerto Rico maintains an agricultural experiment station which has a permanent collection of more than 400 varieties of cane, making it one of the largest in Central and South America. It has conducted experiments

(1) Chardón, C.E., The Journal of the Department of Agriculture (P.R.), (July, 1927), p. 13.

(2) Chardón, C.E., ibid., p. 24.

on the use of irrigation water, as a result of which it found that the highest yields of cane are produced with small, frequent applications. In connection with insect pest control, it has imported and colonized insect parasites. Through its experiments in land fertilization, it has found that a single application of fertilizer will produce the same yield as an equal amount applied at various intervals. One of its chief direct services to growers is the free distribution of cane varieties. Its work has provided answers to many of the questions confronting growers and has shown the way to many economies in cane management. (1).

Not all of the improvements, however, have been in the field. The central, too, has had its share of amelioration. In recent years only a few have added new mills or engines, but what has been done is to bring about more efficient conditions in existing plant. For example, in 1929 this central took 109 days to grind 83,921 tons of cane, an average of 769 tons daily. In 1940, with the same plant, it took only 99 days to grind 143,731 tons, an average of 1,452 tons daily. In each case extraction was about 93% of the sugar. Most of the improvement which has taken place in grinding is attributable to the adoption of knives and shredders; they have not only increased the grinding capacity but the percentage of extraction as well. Increased labor costs

(1) Annual Reports, University of Puerto Rico Agricultural Experiment Station, (1938), p. 70; (1939), pp. 12 and 65.

have "forced" the adoption of many labor saving devices, with accompanying increases in efficiency. Three-roll crushers have replaced the former crushers which operated with only two rolls. Filter presses have been replaced by rotating filters. Gear ratios have been changed in order to increase speeds. The introduction of electric drives in certain stages of processing has contributed also to the general improvements of a technological nature.

Commenting on these changes, the chief engineer of another sugar company had this to say: (1).

> "Although there have been few new additions to milling plants in Puerto Rico, milling conditions and results have shown great improvement. The improvement is the more remarkable when it is considered that most of the mills date from around 1900, and that restrictions on production have placed the factories in an unfavorable position in recent years."

(1) Romaguera, Arturo, Modernization of Milling Equipment, (Facts About Sugar Magazine, February, 1940), p. 47.

CHAPTER FIVE

FINANCIAL HISTORY

The history of this company is best considered by dividing it into three periods. The first period covered the years from 1911, the date of organization, to 1922, when it went into receivership. The second period was from 1922 to 1930, the inter-regnum of the receivership. The third period was from 1930 to 1939, the decade following the accession of the new management. It is this third period with which this study is chiefly concerned. Although it does not bring the record completely up to date, it is felt that 1939 provides a convenient stopping point because it was the last year in which the company operated as an integrated unit, carrying on both agricultural and mill operations. It was in 1939 that Central Vannina, Inc. was dissolved; its mill, rolling stock, and about 250 acres of non-cane land were sold to a new corporation, Central San José, Inc.; its cane lands, rights of way, and farming equipment were sold to a newly organized partnership, Sociedad Agrícola de Río Piedras, S. en C.

In December, 1930, a five-man syndicate was organized to gain control of the company and take it out of the hands of the receiver. It accomplished this, with the help of bank financing, by acquiring in excess of $300,000 of creditors' claims against the company. From that time until 1939 the company was financed mainly through the syndicate

and not directly by bank loans. Shortly after the new management took over, a bond issue amounting to $415,000 was floated, of which the syndicate subscribed to $314,500 and outside investors took the remainder. Later the syndicate bought up the portion held by the public. For several years the interest on these bonds was in default although it was being accrued regularly on the books of the company. As the bonds were all held eventually by the syndicate, this accounted in part for the building up of a large indebtedness to the syndicate. The liability which arose on account of accrued interest, as well as the bonds themselves, were extinguished in the settlement which took place when the company was dissolved in 1939. A unique feature of the sale of the farming assets to the new partnership was the fact that the partnership found itself with an account receivable on its books after having made the purchase; this was because in the settlement it assumed more liabilities than it acquired in assets.

The syndicate was also dissolved at the same time as the company. Although a very close relationship existed between the syndicate and the company, the affairs of the former have not been subjected to examination and only general comments on it are included within the scope of this study.

Despite these far reaching changes in the organization of the company which have been effected in the last

few years, the management remains unchanged. The three men who are members of the present land-holding partnership are also directors and stockholders of the present mill-owning corporation. They were also members of the original syndicate, so that there has been a continuity of management since the time the properties were taken out of receivership.

The proprietary equity of Central Vannina, Inc. consisted of one class of capital stock, the holders of which had all the rights and obligations which ordinarily go with a single class of corporate stock. Their right to receive dividends, however, was never anything more than a theoretical right as the results of operations during the entire decade never warranted the payment of any dividends to stockholders.

When the new management took control in 1930 there was, in effect, a reorganization of the company. In the majority of corporate reorganizations where a deficit exists at the time of reorganization, the capital structure of the corporation is revised in such a manner that the old deficit is wiped out and the new company, or the new management, starts out with neither surplus or deficit. In this company such was not the case. It continued to carry forward the balance of the deficit accumulated from the time the company was originally incorporated, and was still burdened with this deficit in 1939.

In the first two years under the new management

there were heavy charges made directly to the deficit account for extraordinary losses incurred and valuation adjustments of various assets taken over from the receiver. At the close of the first fiscal period under the present management (about a six month's period, as the company came out of receivership just before the grinding season of that year began), the current position, as reflected in the current ratio, was very poor; the current assets were only 0.9 of the current liabilities. Since that time the current position has fluctuated considerably, from a low of 0.8 at June 30, 1933 to a high of 2.8 at June 30, 1938. The general trend, however, has been one of improvement. At June 30, 1939, for example, it was 2.4. Even this is low by comparison with other companies; the Accountants' Handbook shows a combined average of 3.8 for thirteen sugar companies in 1926, and 3.3 for the same companies in 1927. (1).

During the decade beginning in 1930 the amount of capital stock remained unchanged at $1,200,000. In addition to this capital, additional capital was employed, derived from the bond issue previously referred to, from loans secured by mortgages, and from advances on open account by the syndicate.

A trenchant commentary on the operations of this ten-year period is encountered in the fact that in none of

(1) Paton, W.A., Editor, Accountants' Handbook, Second Edition, (New York, 1939), p. 81.

those years was it necessary for the company to make any payments on account of income taxes.

When the company came out of receivership in 1930 it had somewhat in excess of $1,500,000 in gross fixed assets (land, buildings, machinery, etc.). At the end of the ten-year period these assets had increased to more than $1,900,000 gross value. Additions to the factory and its equipment accounted for $100,000 but the remainder of the increase can be mostly traced to the development of a single situation.

In 1932 a few colonos had been permitted to accumulate balances on loans far in excess of their ability to repay them and the situation was distinctly unhealthy. For example, four colonos had balances aggregating $180,000, not including their arrears of property taxes. Although the company was not holding any mortgages on the land of these colonos, an arrangement was made whereby their land was turned over to the company in settlement of their indebtedness. In addition, the company assumed a large amount of property tax arrearages incident to this land but was able to effect an arrangement with the taxing authorities whereby the delinquent taxes were to be paid in instalments, with interest, over a period of years. This deferment of taxes was part of a moratorium granted by the Insular Government to afford relief to property owners affected by a recent hurricane. Nine years later about half of these taxes still remain unpaid. The land acquired in this transaction was valued by the company

at what it considered a conservative amount, but this valuation was considerably less than the amount of loans liquidated by the transfer, entailing a loss which was charged against deficit. Incidentally, the valuation used by the company for setting up this land was in excess of its assessed valuation but the latter is notoriously low throughout the island.

This acquired land, being cane land, was continued as such by the company. Because of the large increase represented by its acquisition, it became necessary to increase the investment in such related agricultural assets as working cattle, carts, tractors, and farm implements. The increase in these assets was essential to insure the proper cultivation and harvesting of the new land.

To summarize, there was an increase in fixed assets during the ten-year period ended in 1939 of $400,000. It was composed of $100,000 for additions to the factory and factory equipment, and $300,000 for land acquired by default, and for the working cattle and equipment needed to cultivate and harvest this land.

The depreciation rates used conform to those approved for income tax purposes by the Puerto Rican Department of Finance and appear to be quite conservative. There has been no change in the basic rates applied during the ten-year period. Depreciation is computed on individual items which is a more accurate method than applying rates to entire classes of fixed assets as a group. This method serves to dis-

close those assets which become 100% depreciated at any time. However, the company's policy in the case of assets which become fully depreciated is to examine the asset in question and ascertain if it has any remaining useful life; when it appears that the asset has not reached the end of its useful life, an adjustment is made reversing a portion of the depreciation already provided, and the asset continues to be depreciated on the basis of remaining useful life. This has the effect of prolonging the provision for the particular asset, but there is no difference in the final result as depreciation cannot exceed 100% of the asset value in any case.

In keeping with its conservative depreciation policy, the company judiciously observes the distinction between expenditures for capital and revenue. All disbursements on account of repairs and even some items for replacement are charged to expense or costs. All expenditures which are to be capitalized are carefully scrutinized beforehand as to the advisability of capitalizing them.

Nevertheless, a detailed study of the various categories of fixed assets and their related reserves for depreciation brings out an anomalous situation. At June 30, 1930, or shortly after the inauguration of the present management, the depreciable assets, as a group, were 33% depreciated on the books; i.e., the reserves for depreciation were 33% of the gross book value of all assets subject to depreciation. Ten years later, at June 30, 1939, this over-all percentage

had increased to 77% and, in the particular case of the factory and its equipment (by far the largest single classification of assets), to the incredible amount of 86%. Ordinarily this is evidence that the annual depreciation has been computed at too high a rate or that replacements treated as current expenses should have been capitalized. It does not necessarily mean that the factory and its equipment have almost reached the point where they would be good only for junk. It is sometimes contended that it would be impossible for a machine to operate properly if it were allowed to deteriorate below 50% of its normal condition. That is probably not the case here. Deterioration and book depreciation do not generally proceed at the same rate. "It is claimed that a freight car can be operated at 70% of maximum efficiency on its last trip before it goes to the scrap pile." (1) Deterioration may proceed at a different rate each year, while book depreciation here is considered for convenience on a straight-line basis with equivalent annual rates.

In connection with the financial discussion in this chapter, it may be worthwhile to comment on some of the accounting features which are peculiar to sugar companies. In the ordinary business which has an inventory of stock in trade, or an inventory of products which it has manufactured, it is customary to carry that inventory on the time-honored

(1) Montgomery, R.H., Auditing Theory and Practice, (New York, 1934), p. 267.

[illegible]

[illegible]

[illegible]

[illegible]

basis of cost or market, whichever is lower. That, of course, presupposes that the costs are definitely known or ascertainable. In the case of a trading business the cost of the stock in trade is the invoice cost or purchased cost. In most manufacturing concerns the cost of the finished product is a composite of all accumulated costs, such as raw material, labor, and overhead chargeable to the manufacturing processes; in other words, a number of elements are brought together to form one completed product and the costs are similarly assembled. The processing of sugar, naturally, is a manufacturing operation but it differs in one major aspect from most other manufacturing processes. It begins with one raw material - sugar cane - but it terminates with several products - raw sugar, molasses, bagasse, etc. The problem is how to assign accurate costs to these several items which are products of the same processing operations. A similar problem is encountered in the case of mining, packing, and oil refining companies, all of which have several products deriving from the same operations. Any assignment of costs to the products would at best be done arbitrarily. This company follows the commonly accepted procedure of valuing its inventories of sugar at the New York Market selling price, less the expenses of selling and delivering in that market. These expenses include the cost of loading at the mill, transportation to San Juan, unloading and storing at San Juan, ocean freight, insurance, commissions, and the expenses of weighing, sampling,

and testing in New York. In the case of raw sugar these expenses currently amount to approximately $0.30 per hundredweight. The inventory of molasses is valued at local market prices.

The main objection to this basis of valuation from the viewpoint of accounting theory is that it anticipates profits which should not ordinarily be taken up on the books until realized. This is usually held to be when the product is sold to a customer. The method is followed here as a matter of expediency and, if the reader or analyst of the balance sheet is advised of the method followed (as they are), no one is harmed by it.

The bagasse, which is as much a by-product as molasses, is used as fuel in the mill. Because of the circumstances mentioned no accurate cost can be determined for it. As a matter of fact, no value whatsoever is assigned to it and, in its consumption as fuel, no charges are recorded for fuel costs. There is no serious objection to this for, under one method of accounting, any value attaching to it would be shown as a deduction from the cost of manufacture, and the net result would be precisely the same. The advantage to this method is that fuel costs would be more completely stated for purposes of comparison and analysis.

Another significant variation is found in the profit and loss statement of the company. The average company which is engaged in the sale of a product shows in its profit and

loss statement the item of "Sales" as the major item of revenue or income. If it has conformed to generally accepted accounting practice, all of the individual sales included in the final total will represent bona fide sales which have been actually consummated during the fiscal period represented. However, in the profit and loss statement of this company (and of most sugar companies) the principal item of income is entitled "Sugar Produced". It is a composite of two factors; the larger by far is the aggregate of all sales of sugar made during the period; the other consists of the inventory of sugar on hand at the close of the period, valued at net selling prices as previously explained. This inventory sugar, as the name implies, is the amount of sugar actually on hand; it is not only undelivered but is unsold at the end of the period. The same is true of molasses. The reason for this manner of accounting treatment goes back to the problem of costs. Since the costs cannot be accurately determined, any inventories remaining at the date of the balance sheet have to be recorded at net selling prices and the offsetting entry is found in the item, "Sugar Produced", in the profit and loss statement.

The company does not trade in sugar futures. When sales are made, they are for immediate delivery. This means, for example, that no shipment would be made to New York unless an order for it had been previously received and the sale consummated.

One other characteristic of the accounting for a company of this type is shown in the case of its growing crop of cane. The company recognizes its natural business year and keeps its accounts on a crop-year basis which is not the same as the calendar year. It will be recalled that the busy season, the period of grinding operations, ends in June. Consequently, the company closes its fiscal year on a conformable basis at June 30th.

At the close of each fiscal year there remains in the field some standing cane which is not cut because it will not be ready for harvesting until the following season. Some of this cane is represented by gran cultura planted several months previously; some of it is primavera planted in the spring months immediately preceding; and some of it is a ratoon crop which has just been cut. Regardless of the type of cane represented, the company has incurred expenditures on account of planting, fertilizing, cultivating, etc., applicable to the standing cane. These disbursements are classified as to the year of the crop to enable the management to know the total costs of each crop of cane.

This standing cane at June 30th each year is an asset of the company and is so included in the balance sheet of that date. The only question is one of valuation and it does not present any complex problem. The customary procedure is to value this cane at an amount which represents the collective value of all costs contracted on it up to that

time. Of course, these do not include any costs which will be incurred in the future, i.e., up to the time of harvesting in the following season.

An understandable reluctance on the part of the management compels omission of the detailed figures relating to the distribution of the income from sugar. However, certain pertinent data have been secured and are herein incorporated for what significance they may have. The following presentation represents a compilation based on averages for the ten years from 1930 to 1939. It is somewhat condensed and is subject to the comments which follow it. It shows the average percentage which each item bears in relation to total revenue, and also shows the average number of dollars and cents per hundredweight of sugar for each item.

	Percentage of Total Revenue	Dollars Per Cwt. of Sugar Produced
Revenue:		
Sugar produced..............	92.0	$3.09
Government compensation....	4.2	.14
Molasses produced..........	2.4	.08
Other income...............	1.4	.05
Total revenue.........	100.0	$3.36
Expenses:		
Cost of cane...............	55.4	$1.86
Mill costs.................	9.2	.31
Depreciation...............	8.1	.27
Selling and shipping.......	7.6	.26
Interest expense (net).....	7.6	.26
Railroad costs.............	4.1	.14
Administrative and general.	3.9	.13
Taxes......................	3.5	.12
Insurance..................	1.4	.04
Miscellaneous..............	1.3	.04
Total expenses........	102.1	$3.43
Net loss.......................	2.1	$0.07

Government compensation comprises two types of payments: Agricultural Adjustment Administration benefits and soil conservation benefits. The former accounts for nearly all of this type of compensation payments but there is some distortion in its presentation here. Payments by the Agricultural Adjustment Administration were received in only four of the years tabulated but, in order to make the schedule balance, they are averaged as if they were received in each of the ten years in the period. The effect of this is to understate the figures for both the percentage and the cents per hundredweight of sugar. On the basis of the four years in which these payments were actually received, the percentage would be 9.3% and the corresponding amount per hundredweight of sugar would be $0.33. This, of course, makes it a substantial item of revenue. It should be understood that these payments were made to the company in its capacity as a grower of cane and not as a processor. If the company were engaged solely in the processing of cane, it would receive no benefit payments. Therefore, the relation of these payments to sugar produced is rather misleading.

The item of other income includes net rental income, syrup produced, and miscellaneous credits. The income from syrup was derived in one year, 1935, when some cane was ground for syrup only. Because of the procedure followed in computing the averages, the amounts shown for other income are slightly overstated.

When a company is engaged in departmental operations as this one was (the two main divisions having been the growing of cane and the processing of it), a fundamental tenet of both accounting and management is that the costs for each department should be entirely segregated. As applied to the case in point, it means that the records should reflect accurately the cost of growing the cane and the cost of processing it. This states it rather broadly but in practice it would be carried out in great detail.

The cost records of this company did not make provision for this essential analysis to the requisite degree. Specifically, such items as depreciation, insurance, and taxes apply in part to field operations (cost of cane), and in part to mill operations (cost of processing); but the accounts did not undertake to distribute them. The result, as it affects the tabulation above, is to understate the figures for both cost of cane and mill costs. It was not considered practicable to attempt a detailed analysis of those charges which should be distributed.

Regardless of this understatement, it should be noted what a relatively large portion of the total revenue goes into the cost of cane. And it represents 54% of the entire total of expenses. With the qualification noted above, the cost of cane includes the costs of administration cane and the cost of colono cane purchased, together with the transportation bonuses paid on the colono cane delivered to

the central by truck. The railroad costs might well be added in their entirety, to supply a cost figure representing the delivered cost of cane; if this were done, cane cost would be a little in excess of 58% of total expenses.

Considerable interest is evinced as to the question of cane costs incurred by colonos as compared with the cost of administration cane. The difficulty with a comparison of this type is that the average colono keeps little or no account of his income and expenses, and if he does keep records they are generally inadequate. As a rule, the cost to the company of purchased cane is less than the cost of their own administration cane. This would seem to indicate that, unless he were selling his cane at less than cost, the colono could grow cane more cheaply than the company. In connection with this, the Brookings Institution had some studies made for it on a very limited basis. These showed that on independent farms with less than fifty acres (sugar cane being the principal crop) the expenses exceeded the receipts. It should be pointed out, however, that expenses included amounts for unpaid labor and imputed interest on investment great enough, if omitted, to swing the balance in favor of an excess of receipts. (1). If the colono were selling his cane at a price less than cost he could not, of necessity, continue to do so for long.

---

(1) Clark, Victor S., et al, Porto Rico and Its Problems, (Washington, 1930), p. 623.

The general impression seems to be that the colono can produce more cheaply than the company, and that in previous years the margin between them was even greater. While definite proof is lacking, there seem to be certain conditions which would tend to make this assertion valid. In other years the wages paid by colonos for their labor were less than the corresponding rates paid by the company. That situation has been changed with the coming of the Agricultural Adjustment Administration which requires colonos to pay the same wage scales as the company, if they would qualify for the benefit payments. Nevertheless, colonos do not have to maintain the offices and office staffs which the company does. They act as their own overseers and supervisors, without any outlay for salaries. If they employ less than four workers, they are not required to make contributions for workmen's compensation insurance. If they own their land, their costs include no charges for rent of land. Their overhead costs are generally lower all around.

Depreciation has been previously commented on. The rates used in computing it have been stated to be conservative, but it is possible that they are too conservative. The total charges for depreciation certainly appear high and they are higher relatively than for other sugar companies.

Interest expense appears to be unconscionably high. It is all actual interest, no effect having been given to imputed interest. Most of it arose on account of the heavy in-

debtedness of the company to the syndicate, represented by interest-bearing obligations of various types.

Taxes include the more important types of taxes paid, such as property taxes and the tax on sugar production. No provision for income tax is included, however, as none was paid during this period.

Insurance appears to be somewhat excessive but it includes the cost of coverage on all property with the exception of growing crops. Because of the all too real possibility of damage by hurricane, insurance is carried to guard against this kind of loss at commensurately high premium rates.

The average net loss incurred by this company is somewhat at variance with the results obtained by other companies in the island, especially the larger ones. As a whole, the industry has become accustomed to being criticized for being too prosperous (a matter not within the scope of the present study). One reason advanced by an official of this company for its poor results of operations was the general inferiority of the land in the mill area. This is no doubt true, as the land in the south of the island which is flatter and permits irrigation, has much higher yields than the land in the north of the island where this central is located. Cane land values in the southern part are relatively higher, also.

But as there are centrales in the north operating

at a profit, there are other possibilities which might be briefly examined. The margin of loss is small - 2.1% of total revenue - and if economies of 3% could be effected in the expenses, the loss would have been replaced by a profit, however small. It is possible that depreciation rates could safely be decreased somewhat and yet retain the advantages of the maximum rates for income tax purposes. The scale of wages paid is fixed as a result of an agreement with the union; the amount paid to colonos for their cane is fixed according to law; as a result, it is extremely unlikely that any savings could be effected from two such inflexible items.

The item of interest holds possibilities. Most of the financing was done through the syndicate (now replaced by the partnership) and most of the interest payments were on indebtedness to the syndicate. By almost any criterion, the amount of interest which this company has paid has been high. When it assumes such proportions as 7.6% of the total income, it becomes evident that there is something aberrant about the situation. It might be the result of a top-heavy capital structure or it might be construed to represent a means of distributing the income to the owners (the syndicate played the dual role of both creditor and owner). The syndicate might have been satisfied, as owner, to permit its profits to be paid as interest to the principal creditor (itself). Of course, this is based in part on supposition for the reason that this study did not embrace any of the details

of the syndicate, nor was any audit made of the company itself. The only completely accurate picture of the situation would be that shown by consolidated financial statements of the two enterprises.

In Charts I and II, on pages 85 and 86, there are presented in graphic form some important data pertaining to the company for the ten-year period from the crop-year 1930 through the crop-year 1939. Both charts are entirely relative, as all data presented therein are expressed as a percentage of the base year 1930 taken as 100%. The other years are shown as a greater or smaller percentage than 1930. There is probably no such thing as a normal year in the local sugar industry because of the perennial presence of so many variable factors. The industry has its foundation in an agricultural operation and, like all farming operations, it is subject to wide fluctuations. In discussions of quotas based on so-called normal years, sugar men are prone to refer to their best years as being their normal ones. This is understandable for, after all, they are only looking out for their own interests when they do this. 1930 is here used as a base year, not for any claim it may have to normalcy, but because it was the first year of the period and is more convenient.

In Chart I are plotted the following:

<u>Rainfall.</u>

This is on the basis of total annual precipitation for the various crop-years, as

reported to the United States Weather Bureau by the Río Piedras Station which is adjacent to the mill area.

Cane.

This represents the total number of tons of cane ground each year.

Yield.

This is the weight percentage of sugar obtained from the cane ground.

In Chart II are plotted the following:

Production.

This represents the total annual production of 96° raw sugar of the company.

Price.

This is the average annual selling price of the sugar produced. It is the actual average obtained by dividing the value of the sugar produced by the tonnage of sugar produced.

Value.

This is the dollar income of the company derived from sugar production.

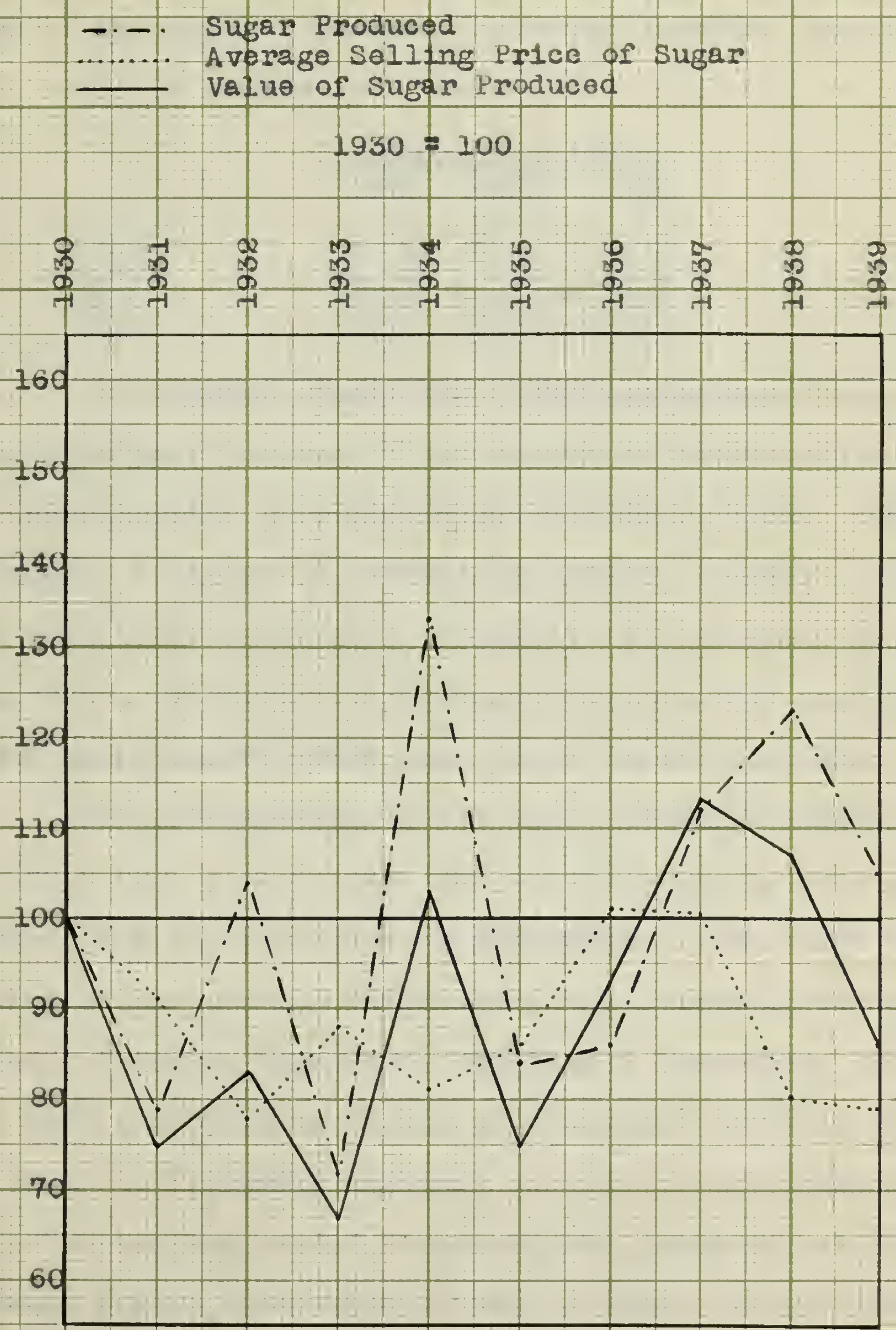
Generally speaking, there is quite a close relationship between the amount of rainfall and the tonnage of cane produced. This relationship is not brought out as clearly as it might be in Chart I for two reasons. In the first place, the company was increasing its acreage during the period covered, so that there are years of decreased rainfall in which cane production actually increased. Secondly, the rainfall figures employed are aggregates for each year and do not show monthly intensities. It is not only the total amount of precipitation received during the year, but also the distribution of that precipitation during the year which counts in

CHART I

Relative Data for Rainfall, Cane Ground, and Yield of Sugar for the Ten Years from 1930 to 1939.

CHART II

Relative Data for Sugar Produced, Selling Price and Aggregate Value of Sugar Produced for the Ten Years from 1930 to 1939.



the final analysis. The uneven distribution of rainfall in this area can be briefly illustrated by reference to a few samples of the monthly rainfall selected from the record of the ten years as follows:

	Rainfall in Inches		
	1932	1936	1938
March	1.16	0.88	3.45
April	1.65	1.87	2.20
May	13.03	16.11	5.14
June	9.16	5.49	17.55

It is quite normal for yield percentages to vary from year to year because of the number of uncontrolled variables affecting the growing and processing of cane. The long-term trend for yields is definitely upward, however. The annual variations in Chart I illustrate the reasons why, in Chapter Four, averages for five-year periods were employed to show the improvements which have taken place in yields.

The relationship of the three items included in Chart II is even closer than that of the items in Chart I. The value line is, of course, a composite of the other two; for value is the product obtained by multiplying production by price. Although sugar is a relatively low-priced commodity and is subject to strict governmental control, its price tends to fluctuate somewhat as that of any other commodity. During the period concerned the price of raw sugar was almost always lower than it was in 1930. In two years only did its average price exceed that of 1930, and then by merely a slight margin.

The remainder of this chapter is devoted to pertinent comments on the year-by-year developments reflected in the two graphs.

1930. This is the year in which the present management acquired control of the company and is the year used as the starting point for all graphed data.

1931. A price decline to 86% was accompanied by a production drop to 79%. This resulted in a decrease in the value of production to 75% of 1930's value.

1932. In the face of what turned out to be further price drops, the company increased its cane acreage. The result was a jump in production to 104% but an increase in value to only 83% of the base year. Part of this increased production can be attributed to improved yields.

1933. A hurricane severely damaged the crop, forcing production to the lowest point of the decade. It was compensated for,in part, by an increase in price. The hurricane was local only and it would not appear that the decreased supply of Puerto Rican sugar would have much, if any, effect upon the New York Market price.

1934. Production-wise, this was the best year of the period but the improvement was only partially reflected in the value figures because of a diminished price level.

1935. The program of the Agricultural Adjustment Administration became effective. Crops were restricted and production tumbled. The price decline was temporarily checked

and even showed some slight improvement, as the program was applicable to all United States producers of sugar. The yield was abnormally low because of distortion due to the fact that a considerable quantity of cane was ground only for syrup and rich molasses.

1936. The yield resumed its upward trend, not to be interrupted again in the period. Further restrictions were imposed by the Agricultural Adjustment Administration, shown by the second successive decrease in cane production. They had the effect, however, of stimulating the price.

1937. As a result of generally improved economic conditions in the United States, there was a large increase in the quotas. The increase appeared to be justified, as per-capita consumption of refined sugar in the United States increased more than 3% over the previous year (1), and the price held firm. It enabled the company to step up its sugar production to 112% of 1930's and have returned to it the highest total value of the decade. The earnings were also the highest for any year of the period.

1938. The decline in price was generally attributable to the setting of too high quotas in the face of a United States business recession. Although the company produced its second highest quantity of sugar for the period, its value decreased. An exceptionally large quantity of sugar was also carried over as inventory.

(1) Farr's Manual of Sugar Companies, (New York, 1939), p. 11.

<u>1939.</u> The close of this crop-year came before the outbreak of hostilities in Europe, so that no effects of them are reflected in any of the data. It was a year which witnessed the continued downward trend of prices, production, and proceeds.

CHAPTER SIX

LABOR RELATIONS

General problems.

The labor problems of this company are quite similar to those of other sugar companies on the island. Whether they are large or small, one of their most serious problems is that of seasonal unemployment. The basic nature of the operations (a busy season, coincident with harvesting, lasting from sometime in January to sometime in June) is such that no method has yet been devised to overcome to any degree the effects of the seasonality of employment. The dead season witnesses a large drop in the number of people employed both in the field and in the factory. The enigma of providing for these people while they are not employed poses a grave social and economic question.

Because of the commonplace nature of most of the work and the workers, the company does not keep a personnel department nor any statistical records of employment. However, in one year (1935) it made a special study of some of the details of its employment and parts of the data obtained have been made available and will be referred to in this chapter. One section of it summarizes the number of workers employed in the field and in the mill for each month of that year. It shows at a glance the extent of the seasonality of employment.

Month	Number of Workers Field	Mill
January	962	232
February	1,049	171
March	1,141	193
April	973	177
May	1,156	221
June	1,608	170
July	1,047	94
August	1,078	65
September	909	58
October	1,046	127
November	883	124
December	689	140

In the field the peak months are usually May and June, for it is in those months that the cutting of cane is proceeding simultaneously with the cultivating of the new ratoon crop and the planting of new cane. In the central the period of greatest activity comes between January and June while the cane is being ground. Although there is no grinding after June, a small force is retained to make repairs, to clean, and to maintain the factory and its equipment. A thorough overhaul takes place during the dead season. In the last three months of the year this work in the factory is intensified in final preparation for the opening of the grinding season in January.

Prior to 1936 the mill operated on two daily shifts of twelve hours each during the grinding season, so that the employment figures given above are on that basis. In 1936 three daily shifts of eight hours each were instituted which had the effect of increasing the number of mill workers about 50% during the grinding season.

The average number of workers employed in the field in 1935 was 1,045, and in the factory 147. This gives a rough ratio of seven field employees to one factory employee, which is about average. The field work is almost entirely manual labor in contrast to the work in the central which is quite highly mechanized.

In its extremes the seasonality of employment is indicated by a comparison of the low month with the peak month for both field and mill workers. For the former the employment for the low month of December was only 43% of that for the maximum month of June. In the case of the mill workers, the number employed in the minimum month of September was only 25% of the number employed in the peak month of January.

In both the central and the field most of the employees are residents of the mill area. During the busy season an indeterminate number of workers are attracted from other sections. Some of these work in the coffee regions during the dead season as coffee follows a crop cycle about opposite to that of sugar cane. But, in general, insular labor is characterized more by its immobility than by its mobility.

In recent years there have been felt some of the effects of technological improvements. The principal improvement in the field has been the introduction of tractors but this has not had any great tendency to displace labor.

Because of the large amount of rough and hilly land in this area the use of tractors is quite limited and the great majority of operations continue to be performed manually.

In the space of the last ten years there have been comparatively more technical improvements in the central than in the field. The result here, however, has been an increase in the total productivity and a decrease in unit costs rather than wholesale displacements of labor. The central operations are highly mechanized but the greatest strides in this mechanization took place in the years between 1900 and 1915.

The company does not employ women in any operation of the field or factory. During the busy season a few boys may be employed in the field to perform tasks of a miscellaneous nature but their total is relatively insignificant. Fourteen years of age is the statutory age limit for the employment of boys without the special permission of the Insular Department of Labor.

Collective agreements.

The labor movement in Puerto Rico has been characterized by a slow growth. Prior to the date of the American occupation it was retarded by the old Spanish Conspiracy laws which placed obstacles in the way of labor organizations. Not until 1902 did the courts decide that the workingmen of the island had the right to organize in unions for self-protection. Writing in 1930, the authors of the Brookings Institution survey noted that,

> "During the last quarter of a century, the movement has gathered strength in the political field, where labor organizations form the background of the powerful Socialist party. But the unions have not been able to surmount the handicaps of an over-crowded labor market and the poverty of their members so as to win signal victories by direct action. Wages have risen in the organized trades, but probably not much faster than in unorganized occupations. The working day has been shortened by agreement or, in the case of public contracts, by legislation. . . . . . . The main accomplishments of the labor movement have been achieved through political action." (1).

These comments are almost equally valid at the present time. An ever-increasing population has not decreased the available supply of labor in a market where little skilled labor is required. There has been little, if any, change in the economic status of the union members; poverty is the rule rather than the exception. The long-term trend of wages has been in an upward direction and since 1930 the working day of the sugar worker has been shortened still more. The position of Puerto Rican labor to-day is due largely to results obtained through political action. The leaders of the labor movement double in politics.

In the case of the subject company, it has no company union either in the field or in the factory. As a matter of fact, there is an open shop in both of the main divisions although a union scale of wages is paid. Previous to

(1) Clark, Victor S., et al, Porto Rico and Its Problems, (Washington, 1930), pp. 51-52.

1933 there was a considerable lack of uniformity as to wages, hours, and related labor matters throughout the industry. In that year there was signed the first collective agreement aimed at standardizing and improving labor conditions. Individual cases of opposition have been generally straightened out until the present results have been obtained. This does not necessarily mean that the industry, or any part of it, works in perfect harmony with labor or that all demands of either side are granted. But it does mean that labor has come a long way, that relations to-day are an improvement over those of yesteryear, and that a uniform agreement is in force for all the sugar companies of the island.

The manner in which the collective agreements (known as convenios) are arrived at is unusual enough to merit brief comment. Each year before the active season gets under way, representatives of labor sit down at the conference table with representatives of the sugar companies (Sugar Producers Association of Puerto Rico) and discuss their problems and claims. The matter of wages generally forms the main topic of discussion. Although the Association does not have the power to bind its members in any agreement which it may enter into with labor, as a rule, the member companies agree to and abide by the terms of it. Since in most companies there is an open shop, the labor leaders do not necessarily have the united backing of the men they are there to represent. The significance of this is that they may not

be able to rely on the threat of strike to enforce their demands, as they cannot be sure that an order to strike would be effectively carried out. There have been strikes but there have also been cases where the leaders have unsuccessfully advocated strikes. For example, a few years ago this company had agreed to the terms under which it was proposed to operate during the ensuing season and was actually paying the scale of wages called for, but had not yet formally ratified the agreement by signature. The labor leaders, in an attempt to enforce immediate signing, ordered a strike. As they lacked sufficient support from the workers, it was nothing more than an abortive attempt. To a degree, the power of the labor leaders is political, with all that such power connotes.

The union with which the industry has its dealings is known as the Federacíon Libre de Trabajadores de Puerto Rico and is affiliated with the American Federation of Labor on the mainland. The agreements with it are for a minimum period of one year and are extended automatically if neither party requests a revision. As it has worked out in practice, the workers have some changes to seek annually. Some of the provisions of the current agreement are important enough to justify inclusion and they are presented here with pertinent comments.

The contract applies to all classes of field and central employees and defines, by type of work, the workers

who are included in each group. A working day of eight hours is set for all types of labor, with the minor exception of some classes of more arduous field work which have a limit imposed of seven hours daily. The company will do its best to spread the work as much as possible but, if it is necessary for the men to work overtime, then they are to be paid double the regular rate. Over a period of years the working day has been gradually shortened but as recently as 1935 the mill operated during the busy season on two shifts of twelve hours each.

Minimum wages are set for each class of workers, varying from $1.00 per day for the lowest paid group of field employees to $3.15 per day for the drivers of the largest locomotives. This latter group, as might be imagined, is a comparatively minor one. In the field the greatest number of men receive between $1.00 and $1.21 per day. The minimum daily wage in the mill is $0.30 an hour, or $2.40 for an eight hour day. This daily rate of $2.40 is the modal rate for the mill, by far the largest number of employees receiving this rate.

In the central the company is required to comply with the provisions of the Federal wage requirement which at present is the minimum rate mentioned of $0.30 per hour. But this only embraces about one seventh of the total number of employees. Those who are engaged in the agricultural part of the operations are exempt from this legislation, yet

numerically they constitute the major branch of the company's activities. Their benefit from legislation is an indirect one. The Agricultural Adjustment Administration is empowered to regulate the wages paid by those who would qualify for compensation payments. This power to regulate field wages also extends to the wages paid by colonos. In practice it works out that the Secretary of Agriculture defers any action on wages until the collective agreements are signed each year and then places his official approval upon them. In the case of the colonos, the same scale of wages must be paid if they are to qualify for compensation payments.

In the years immediately preceeding 1940 there existed a rather inequitable situation with respect to wage scales. The agreements of those years contained two sets of wage scales - one for the centrales in the coastal areas and one for the centrales in the interior. The classifications of labor were the same but the interior centrales were permitted to pay slightly lower wages in each case. This situation, however, no longer exists.

If the price of raw sugar in the New York Market exceeds $3.00 per hundredweight, all classifications of workers receive an increase of $0.10 per day for each $0.25 increase in the price over $3.00. This wage-determining price was originally set at $4.00 per hundredweight but the downward trend of sugar prices seemed to make it impossible of attainment and it was accordingly dropped by degrees to the

present price of $3.00. Until recent weeks raw sugar had not sold in New York at $3.00 since December, 1938, with the exception of the three months following the outbreak of war in Europe in September, 1939. (1). This provision, however, recognizes labor's right to participate in the prosperity of the industry above a certain point but it has also been criticized by friends of labor as a deceptive measure of prosperity. This criticism is based on the statement that earnings do not necessarily fluctuate in proportion to the price of sugar.

The company agrees to give preference to members of the union in employing workers. A large number of the field employees are union members but the union is not yet strong enough to insist upon a closed shop. This provision would appear to be a sop to labor and at the same time is not too great a concession on the part of the company.

The company agrees to provide as far as possible its workers who live in company houses, with small pieces of land to be worked by them for subsistence crops. This land is rent free and tax free and is principally cane land, lying unused because of crop restrictions. It is planted by the workers during the dead season with crops which can be harvested in about three months. It not only provides them with some of their food requirements but, in many instances,

(1) Farr's Manual of Sugar Companies, (New York, 1940), p. 174.

with a supplemental cash income as well. Although it is not a part of the agreement, some of the other companies even supply their workers with the seed for this land. This is a small scale attempt to overcome the dependence of the laborers on high cost imported food. The island is so well fitted to the production of a few staple crops that it has largely concentrated on them to the comparative exclusion of food-for-consumption crops.

It is required that the employees be paid weekly in cash. Unless the worker has previously given his consent, the company cannot make any deductions from wages to apply against any indebtedness of the worker. No fees or commissions are to be charged as a condition for employment. All of these provisions are aimed at eliminating abuses previously existing in some companies. Some used to maintain stores where their employees were required to make their purchases and pay for them with wage vouchers. This should not be taken as an indictment of the industry as a whole, as there were, and are, many companies whose main object in maintaining stores is to make available to their employees essential commodities at lower prices than prevail elsewhere.

Employees are not to be required to join a company union and they are not to be discriminated against in any way for outside union activity. If a discharged worker can show cause that he was released because of union activity, he can secure reinstatement by appeal to a committee of ar-

bitration.

In the event of disputes as to any terms of the agreement or in the case of some contention between the company and its workers, a joint committee of arbitration holds hearings. It is composed of two representatives of labor and two representatives of the employers. If these four are unable to arrive at a decision, they must unanimously agree upon a fifth member who will then cast the deciding vote. Both parties agree to submit to the decisions of this committee but, pending such decision, the status quo is to be maintained. There have been several instances, however, where the workers have gone on strike at once instead of maintaining the status quo until a decision was reached by the joint committee of arbitration. Most minor disputes are settled directly between company and worker.

A unique provision which affords an insight into what goes on within the minds of some sugar men is the one which specifies that if the price of sugar should become fixed by the government, then the agreement is subject to revision. As yet, the government has sought only to control the available supply of this staple but with the extremely uncertain conditions which obtain throughout the world today, there remains the ever present possibility that price, too, will be subject to control.

The contract is significantly silent on two points - piece work and rates of pay for cutting burned cane. At the

present time this company does not pay piece rate wages for any operation in either field or factory. Formerly, piece rates were paid by some companies to the cane cutters on the basis of the number of square yards cut in a certain length of time, or on the basis of the weight of cane cut, or on a composite basis involving both factors. Another type of piece work involved contract labor, where the company contracted with individual labor contractors to plant or cultivate land at a specified rate per acre. The union vigorously criticized all types of piece rate wages and alleged that they were inequitable to the worker. It maintained that weights and measurements were not carefully computed and that workers might be handicapped by having to work in rough terrain or having to cut thicker cane. On the other hand the employers saw advantages to such a system because it would impel greater efficiency on the part of the employees. It also offered them the opportunity for larger earnings since they would earn in proportion to individual productivity. Up to this time labor has won and the collective agreements make no mention of piece rate wages but provide instead for daily rates of pay for the various classes of labor without regard to the efficiency or productivity of the individual laborer.

As for burned cane, it is the practice in some cane regions to burn a field before the cutting begins. A large part of the leaves are dry and burn readily without damaging

in any way the stalk which is heavy with juice and non-inflammable. It has the effect of clearing out much of the trash and makes the cutting a great deal easier which, in turn, raises the output of the individual. This company has had to abandon the practice of burning because the workers demanded 50% more pay for cutting burned over fields. They alleged (presumably without much foundation) that it was detrimental to their health when they worked in a burned field. If the unadulterated reason were known it would probably be that they felt that their increased productivity entitled them to a higher rate of pay. In any event, the agreement dodges the issue and makes no mention of rates of pay for cutting burned cane. This is probably the safer way from the company's point of view for, if the agreement provided higher rates of pay for cutting burned cane, there would be constantly present the temptation to set fire to a field of cane ready for cutting in order to secure the higher rates of pay.

Although the convenios have not been able to eliminate completely strikes resulting from labor controversies, there is no question that they have acted as a deterrent and that through them both employers and workers are approaching their common problems with a more conciliatory attitude.

As this company does not keep its records in such a manner that detailed labor costs may be readily analyzed, no data for it are presented here. If its experience is

similar to that of other centrales it would show decreasing unit costs in the face of increasing wage rates. The Bird report called attention to the fact that,

> "The cost situation in more recent years seems to justify the conclusion that mill costs have been reduced to a greater extent than farm costs in sugar production. Technological improvements in the factory and a larger volume of production have brought about a reduction in unit cost at the mill." (1).

This report also refers to,

> "the case of a sugar mill in the southern section of the island whose factory costs have been reduced 73% from 1926 to 1936. Although these costs do not include fixed charges, they bring out very clearly the trend in operating costs." (1).

Messrs. Gayer, Homan, and James arrived at the same conclusion based on the data of three companies producing 23% of all the cane on the island and comparing the results of the year 1928 with those of the year 1935. (2).

Since 1936 there has been a further increase in wages, especially in the mill because of Federal legislation. However, labor costs in the mill form a very low percentage of total labor costs, averaging less than 10% of the total cost of sugar. A recent study of comparative costs of two

---

(1) Bird, Esteban A., The Sugar Industry in Relation to the Social and Economic System of Puerto Rico, (Puerto Rico Reconstruction Administration, 1937), p. 82.

(2) Gayer, A.D., Homan, P.T., and James, E.K., The Sugar Economy of Puerto Rico, (New York, 1938), p. 176.

centrales for the years 1939 and 1940 found that in one case the total factory payroll was greater in 1940 but that mill wages per ton of sugar were lower. In the second case it found that both the total factory payroll and mill wages per ton of sugar were lower in 1940 than in 1939. (1). In all of these results a higher yield of sugar was also a factor not to be overlooked.

Company housing.

With a large part of the work of this company having to be performed in country areas where it is not always an easy matter for a worker to obtain housing on his own initiative, it has been found desirable to provide housing accomodations for some of the employees. A few of the better type houses are located adjacent to the central for the use of some of the officials but the great majority of the houses provided are little better than hovels, most of them without electricity, water, or toilets. Although no current data are available in connection therewith, the study of the company, previously referred to, assembled some pertinent information which is included here. There have been no material changes in the situation since 1935, the date of the study. In that year the company was providing 100 houses for 315 employees. These houses were occupied by 905 people grouped as follows:

(1) Memorandum of Puerto Rico Farmers' Association filed with Agricultural Adjustment Administration, Sugar Section, San Juan Office, (1941).

Rooms Per House	Number of Houses	Workers	Occupants
2	21		254
3	48		322
4	9		84
5	10	No	56
6	7	details	106
8	3		26
9	1		31
16	1		26
Total	100	315	905

This gives a total of 363 rooms for the 905 occupants, or about two and one-half people for each room. Of these 100 houses, 24 had electricity, 42 had water, 25 had toilets, and 75 had latrines.

A comparison of these accomodations with a study made in 1934 by the Insular Department of Labor (1), would indicate that the occupants of the company houses were somewhat better off than the average Puerto Rican. This latter investigation showed that of houses owned by the occupants only 6% had toilets, 8% had baths, and 94% used latrines. Similar conditions prevailed for leased dwellings also.

It can be seen that the number of employees housed is but a portion of the total employed at any one time. The company, in assigning its houses, gives preference to the better type of workers who have more or less steady employment, rather than to temporary workers who are employed for

(1) Rodríguez, A.P., A Report Dealing With Labor Statistics, Cost of Living, Housing Conditions and Craftsmanship of Workers in Puerto Rico for the Fiscal Year 1933-34, (San Juan, 1935), p. 9.

the busy season only. The agreements between the company and the occupants regarding the houses are of a verbal nature.

All of the houses are supplied without charge for rental to the occupants. In those cases where water is furnished, no charge is made for it, but where there is electricity it is paid for by the user. Most of the houses have an adjoining garden plot which can be cultivated by the resident. Those who own cattle are permitted to pasture them on nearby land of the company.

The company estimated that a reasonable annual rental for all of these houses taken together would be about $8,700, or an average of about $27.50 per worker-occupant. The cost of maintenance and repairs averages about $2,000 a year for all houses.

Workmen's compensation.

Puerto Rico has a government administered insurance plan to cover workmen's compensation. Any employer of four or more workers is required by law to contribute to the fund and any employer of less than four employees may, at his option, contribute to it and thereby make his employees eligible for benefits. The company, of course, is a contributor because of its size, if for no other reason.

The plan functions along lines similar to those of workmen's compensation on the mainland, being worked out on an actuarial basis just as any insurance plan is. For the purpose of computing premiums, the employees are classified

by groups according to the risks inherent in their particular type of work. The premium rates vary with the risk of accident and are stated as percentages which are applied to the total payrolls for each group. Experience has shown that accidents occur far more frequently among field employees than any other group and, as a result, the highest rates are paid for this group. It is not surprising that the lowest frequency of accidents is in the group comprising the office force and the rates for this group are extremely nominal.

In spite of the extent of mechanization in the mill, very few serious accidents have occurred there in recent years. During the harvesting season a large percentage of the accidents in the field are caused by men injuring themselves with the machetes used in cutting the cane. Another type of disability common among field workers is an infection resulting from frictional contact with the cane leaves. Instances have been known where a worker has purposely mutilated himself by cutting off a finger or has deliberately scratched himself to get an infection, in order to become eligible for the benefit payments under the law; but these cases are rather exceptional.

The company pays its premiums in advance, basing them on the payrolls for the previous year. Then at the end of the year auditors of the State Insurance Fund audit the payrolls for the year, and the premiums paid are adjusted to conform to the actual wages paid for that year. The total

annual cost to the company is about $40,000, none of which is deducted from the wages paid to employees.

Under this plan the workers are insured against any accident or disability arising out of their employment. In the event of an accident the injured employee reports to his overseer or timekeeper who makes out a form provided and sends the worker to a doctor or hospital for treatment. Both the charges of doctor and hospital are paid by the State Insurance Fund. If the worker is unable to return to work within one week he receives compensation payments based on one-half his usual weekly pay. In those cases where a worker is permanently injured the fund awards him a fixed sum, a portion of which is paid him in monthly instalments until he has received the entire amount so awarded.

The following quotation from a bulletin of the fund will serve to give an over-all picture of the situation for all sugar mills: (1).

> "This manual (sugar mills) was on the border line of surplus and deficit for the first three years, with the net being a deficit, but enjoyed a reasonable surplus in 1938-39. The reason for this is plain. The accident frequency took a very sharp decrease. The increase in premium rate did the rest."

In referring to the situation obtaining in the field, the same bulletin made these comments: (2).

(1) The State Insurance Fund of Puerto Rico, Workmen's Compensation in Puerto Rico, Bulletin No. 2, (San Juan, 1940), p. 39.

(2) Ibid., p. 37.

> "This manual (sugar cane plantations) has had a surplus in only one year, 1937-38. In the year 1938-39, instead of the experience improving, it became worse, even at a higher premium rate. Days disability increased - also the percent of claims compensated and the accident frequency. To make a bad matter worse, the payroll deficiency is increasing and is at a much higher rate than the average for the forty manuals. . . . It is true that wage loss compensation has taken a sharp rise, due partly to the sharp rise in daily wage, but this is also due to the rise in the days disability, the rise in the per cent of claims compensated, and in accident frequency."

Group insurance.

Another form of indirect compensation which should be mentioned is the group life insurance plan which is in effect. It was voluntarily instituted by the company and embraces all permanent employees from those in the field to those in the office. The amount of coverage for each individual is in proportion to his compensation. The minimum coverage for any worker is $500 and the maximum is $2,000. All costs of this group insurance, amounting annually to approximately $1,000, are borne by the company. Because of the shorter life expectancy of an individual in the tropics the premium rates for all types of life insurance are somewhat higher than for comparable insurance in a more temperate zone. If an employee included in the group insurance plan should leave the employ of the company, he may continue his policy as an individual policyholder without being subject to a physical examination, provided he assumes the premium payments himself.

Summary.

It would appear that sugar workers are better off to-day than in previous years, but that still does not say very much. Their wages have been increasing and their working day shortened until they are, as a group, the best paid laborers on the island. Although daily rates of pay have been cited in this chapter, they are not indicative of the total annual earnings of the workers because many of them are employed for only part of the year. The majority of the workers who live in company houses are provided with small plots on which they may raise some food but these opportunities are not as general as in the coffee and tobacco districts.

The survey made in 1930 by the Brookings Institution found an extremely unusual condition existing among families of laborers in general (not sugar workers alone, but a cross-section of working people). It was set forth in the following: (1).

> "These 267 families (the total number questioned) spent approximately 94% of their weekly earnings for a selected group of foods. The largest single item in this expenditure was for polished rice, followed in order by beans, coffee, sugar, and bread. These five items make up about half of the total expenditure. To appreciate the significance of this exhibit, it must, of course, be borne in mind that in the tropics the ordinary demands upon the family purse for shelter, food, fuel, and clothing are at a minimum. . . The bad

(1) Clark, Victor S., et al, Porto Rico and Its Problems, (Washington, 1930), pp. 32-34.

> hygienic results of a diet so lacking in vitamins needs no comment. This is part of the price Puerto Rico pays for its extraordinary degree of specialization and dependence on foreign trade. . . . it has clearly encouraged the use of a monotonous and debilitating diet by a large proportion of the people."

The effect upon real wages of the increases in money wages is not definitely known. Accurate statistics of the costs of living in Puerto Rico are not available. It is apparent from the above dietary comments that mainland indices of costs of living would not provide a satisfactory yardstick for measuring comparable costs in Puerto Rico.

As for the question of paying higher wages, there are sharp differences of opinion, depending upon which side of the fence one happens to be. Bird refers to "the unfair share received by wage earners of the sugar industry" and feels very strongly that "sugar cane growers could improve them without real sacrifice on their part". (1). On the other hand, Gayer, Homan, and James came to the conclusion that, "a dollar a week added to wages and a dollar a ton added to the cost of purchased cane would probably eat up almost the whole profit of good years and create large losses in poor years," and "would still leave rates of remuneration low by mainland standards . . . . and not greatly improved

(1) Bird, E.A., The Sugar Industry in Relation to the Social and Economic System of Puerto Rico, (Puerto Rico Reconstruction Administration, 1937), pp. 48 and 50.

by Puerto Rican standards." (1).

From what has been said it can be seen that the struggle for a share of the sugar dollar is a three-cornered contest. It is divided among colonos, labor, and the company itself, as represented by the stockholders. The colonos receive payment for their cane; labor receives wages; and the stockholders receive their share in profits. It should be evident that any gain on the part of one of these can only be secured at the expense of the other two.

The profits of some companies have been exceptionally good and it is possible that they could increase somewhat their wage scale at the expense of stockholders, but this is not true of all companies. It is probable that any future gains on the part of labor will come about slowly and will be won as they have been in the past. At least it can be said that some of the predicaments of labor have been recognized and that attempts are being made to ameliorate the situation.

(1) Gayer, A.D., Homan, P.T., and James, E.K., The Sugar Economy of Puerto Rico, (New York, 1938), p. 274.

CHAPTER SEVEN

LEGISLATION AND TAXATION

"500-Acre Law."

Shortly after the acquisition of Puerto Rico by the United States it devolved upon Congress to formulate a law under which the new possession could function as a part of the United States. By the Joint Resolution of May 1, 1900 such a law was provided. In many respects it resembled a state constitution except that it had been framed in Washington. In an effort to prevent the recurrence of a situation such as that which then existed in Hawaii where a large sugar industry was dominated by a few powerful interests, the following provision was written into the law and was included again in the Organic Act of March 2, 1917 (in effect at the present time):

> "Every corporation hereafter authorized to engage in agriculture shall by its charter be restricted to the ownership and control of not to exceed 500 acres of land. This provision shall be held to prevent any member of a corporation engaged in agriculture from being in any wise interested in any other corporation engaged in agriculture."

Two things regarding this provision should here be pointed out. It did not mention sugar companies specifically because it had to be general in its applicability, but they are the ones who have been chiefly affected by it. Curiously enough, until recently, no enforcement of the provision was attempted.

It was quickly recognized that one effect of such a provision was to retard the investment of capital in what was destined to be the development of an important sugar industry. As far back as 1902 the Governor of Puerto Rico stated in his annual report that: (1).

> "The principle which would prevent a few corporations from acquiring unlimited quantities of cane lands, perhaps all in Puerto Rico, is a salutary one, but, on the other hand, to confine ownership to tracts of 500 acres is to encounter the danger of a limitation which may retard development through the usual means of corporate organization."

Until 1935, when the Insular Government began legal proceedings against some sugar companies, the provision was completely dormant. In open disregard of the law many corporations went ahead with expansion programs and acquired land in excess of the 500-acre limitation. Other companies formed thinly disguised partnerships for the express purpose of acquiring land on which cane would be grown to be sold to the corporation for processing. One large corporation, with an eye to the law, changed its organization to that of a trust, feeling that such an organization would conform to the requirements of the law. Many corporations lease large tracts of cane land in addition to the land which they own in fee. The land which is leased is generally held to be controlled within the meaning of the law.

Only one case brought by the Insular Government

(1) Governor of Puerto Rico, Second Annual Report, p. 70.

has gone all the way to the United States Supreme Court. In this case, The People of Puerto Rico vs. Rubert Hermanos, Inc., the defendant admitted owning more than 500 acres of land but alleged that the ownership of this land was only incidental to its principal activity, which was manufacturing sugar. When the Supreme Court of Puerto Rico decided for the plaintiff, the case was appealed to the United States Circuit Court of Appeals in Boston (which has jurisdiction in such appeals). This court reversed the lower court and found for the company. Again the case was appealed, this time to the highest court in the land, and the United States Supreme Court reversed the Circuit Court of Appeals and decided in favor of the Insular Government. Subsequently the insular court decreed that the corporation should be dissolved and appointed a receiver for that purpose. The company had no appeal from the decision of the United States Supreme Court but it did not feel that the receivership ordered was the most satisfactory way of carrying out the order. Consequently, it has appealed the question of a receivership to the Circuit Court of Appeals in Boston. No steps have actually been taken yet to dispose of the land holdings and there the matter stands at present.

The whole question of land tenure now being brought to a head by the steps taken to enforce the law is an important one in any discussion of insular sugar. As the Bird Report points out, it is "of special importance in view of (1) the small size of the island, (2) the population density,

(3) the importance of agriculture in its economic life, and (4) the predominance of sugar cane cultivation over all other agricultural enterprises". (1). The concentration of land in Puerto Rico is well illustrated by the table in Chapter Four which shows the frequency distribution of cane marketed and by the table in a later section of this chapter which shows the benefit payments made by the Agricultural Adjustment Administration. Although neither of these tabulations shows acreage data, they serve almost as well because they show two different results which are directly related to the size of individual farms.

In connection therewith, Professor Rafael Picó of the University of Puerto Rico has pointed out that: (2).

> "While the number of small farms is relatively very large, the acreage they include is insignificant. Farms less than 20 acres in size . . . . constituted 72% of the total number in 1930. Yet the acreage they comprise is only 12.4% of the total. . . . . . On the other hand, large farms, 500 acres and over, although only 367 in number (0.7% of the total farms), occupied 31.7% of all the area of Puerto Rico included in farms."

Although he was commenting on the situation which existed in 1930, it is believed that there has been no significant change in the status since that time.

(1) Bird, E.A., The Sugar Industry in Relation to the Social and Economic System of Puerto Rico, (Puerto Rico Reconstruction Administration, 1937), p. 63.

(2) Picó, Rafael, The Agricultural Problems of Puerto Rico, (Puerto Rico Reconstruction Administration, 1936), pp. 21-22.

In Chapter Four it was pointed out that cane yields improved with the size of the farm. Those farms which had a cane acreage in excess of 500 acres showed a yield almost twice as large as that of farms with less than two acres in cane. Consequently, it is contended that the large farms are more efficient and hence, economically justified. Other economic defenses advanced in behalf of a continuation of the status quo are well summarized in the following: (1).

> "Cane cultivation represents the most economical use of the heavy, low-lying lands, creating more wealth and supporting more people than any alternative use of the same lands. The most effective cane culture calls for large-scale agriculture, involving expensive equipment and special technical knowledge. Milling companies must grow cane in order to regularize the operation of mills during the grinding season and to experiment with appropriate types of cane and methods of cane growing. Great technical improvement in cane cultivation has taken place under the existing system of tenure. And finally, it is contended, current proposals for changes in land tenure policy would, if put into effect, diminish the wealth created in the island and therefore undermine its already inadequate capacity to support its population."

From an economic point of view large scale holdings of land would appear to be justified but the problem is not being settled on its economic aspects alone but on the social aspects as well. It is another contest between the "haves" and the "have-nots" and so far the latter have judicial support.

The sweeping changes which would result from the

(1) Gayer, A.D., Homan, P.T., and James, E.K., The Sugar Economy of Puerto Rico, (New York, 1938), p. 294.

application of this law to all of the corporations affected by it are difficult to predict. Instead of solving and disposing of an old problem there would be countless new problems created whose solution is not at all clear at this time. The Department of the Interior has recently appointed a committee to make a study of the whole situation with a view to determining by what means the law can be administered to best advantage. One of the most immediately pressing of all the problems engendered is the question of how to finance the proposed transfers of land to new owners. Practically none of the prospective owners have the necessary wherewithal to finance their potential purchases independently.

The subject company occupies an unusual position in relation to this question. Over a period of years it increased its cane acreage through acquisitions of owned land and through the leasing of land owned by others. By 1939 it held title to approximately 4,500 acres and was leasing an additional 3,500 acres. Because of the perennial nature of sugar cane, the land which was leased was held under leases with a minimum term of five years, with options to renew in most instances. These lands were in the name of Central Vannina, Inc. until 1939 when they were transferred to the partnership, Sociedad Agrícola de Río Piedras, S. en C. Although it came rather late it was a move similar to that made by many of the sugar companies of the island. Technically the partnership is a separate entity but its partners are simul-

taneously directors and stockholders of the corporation.

In October, 1939, the United States Supreme Court handed down the Rubert Hermanos, Inc. decision. In August, 1940, when the Farm Security Administration sought an option to acquire the cane land then owned by the subject partnership, it was granted. This Federal agency plans to divide the land into 130 small cane farms varying in size from 25 to 40 acres each. To this end it has surveyed the land and mapped out the tracts which will comprise each of the 130 farms. As soon as the current crop has been harvested it is anticipated that the option will be exercised and the new farms made available to new owners. Some non-cane land is to remain in the possession of the company.

In this far reaching social experiment, the first of its kind in Puerto Rico, the Farm Security Administration was deluged with 3,000 applications for the new farms. Among other requirements which have to be met by prospective applicants, the agency requires men who have three sons capable of assisting in the work of the farm. The farms are expected to become ultimately the property of the new farmers, assisted by governmental financing. The agency plans to provide them with houses, extend crop loans to them, and generally supervise and guide them in their new venture. In addition, financial assistance will be offered to enable them to acquire working cattle and equipment. The plan does not involve any financing by the subject company. Neither is it

in the nature of a cooperative venture. The total outlay by the agency is not definitely known yet but the cost of the land alone is nearly $600,000. The theory of the project is that the amounts disbursed in behalf of the new farmers will be subsequently recovered from them.

The 130 farmers will have to establish colono relations with some central but they are to be left completely free to make their own choice in the matter. It would be quite natural for them to become colonos of this central because of the proximity of it to the lands in question, but this is a supposition and not a certainty. Because of the experimental nature of the project many of the details will have to be worked out as it progresses. There is no exact precedent for it and the actual results are not predictable.

Will the company have improved itself as a result of all this? No one can say with any degree of certainty. It will not have the large investment in cane land; it will not have to assume any of the risks attendant upon growing cane; it will have none of the responsibility or labor problems which accompany the growing, cultivating, and harvesting of cane; it is possible (not certain) that the cost of purchased cane may be lower than the cost of the cane formerly grown by the company; and because its investment in land will be almost non-existent, interest charges on borrowed funds should be materially decreased. On the other hand, it will lose the benefit payments (which go to the grower and

not to the processor); it may be running the risk of an irregular and uncertain supply of cane; the yield of the cane may be lower; and mill costs may be greater if the flow of cane to the mill is not constant or if the yields are lower. In any event, a social experiment of the greatest significance to the future of the company, the industry, and the island itself, is getting under way.

As for the leased lands (the 3,500 acres mentioned earlier), no decision has yet been made with respect to them. Many of the leases have several more years before they expire. One possibility to which the company has given some consideration is the advisability of sub-leasing these lands to others.

Provisions of the Sugar Act of 1937.

The Agricultural Adjustment Administration functions under the supervision and control of the Secretary of Agriculture who derives his broad powers over the sugar industry from the Sugar Act of 1937. This legislation was passed by Congress after the Supreme Court, in the Hoosac Mills case, invalidated the processing tax and production-adjustment features of the original Agriculture Adjustment Act. The 1937 Act was scheduled to terminate on December 31, 1940, but was extended to December 31, 1941.

The core of the Act is the quota system under which the Secretary estimates each year the amount of sugar needed to meet consumer requirements in the United States. His estimates are based upon the consumption for the previous year

after taking into account such variables as changes in population, purchasing power, etc. He is also empowered to make revisions in the original estimate in recognition of unforeseen conditions. In order to protect consumers against excessive prices the Secretary may increase quotas so that the supply of sugar may be augmented.

The Act recognizes two major sugar producing areas - the domestic, comprising the mainland, Puerto Rico, Hawaii, and the Virgin Islands; and foreign countries (represented chiefly by Cuba) and the Philippines. The total quota is to be divided between these two areas on the basis of 55.59% to the domestic areas (not to be less than 3,715,000 tons, however), and 44.41% to the foreign and Philippine areas. The quotas for the domestic areas are prorated on the following basis:

Area	Percentage of 55.59%
Domestic beet sugar	41.72
Hawaii	25.25
Puerto Rico	21.48
Mainland cane sugar	11.31
Virgin Islands	.24
Total	100.00

The other quotas are prorated as follows:

Area	Percentage of 44.41%
Cuba	64.41
Commonwealth of the Philippine Islands	34.70
Foreign countries other than Cuba	.89
Total	100.00

The foregoing tabulations follow the provisions of the Act but if they were expressed in terms of the percentage which each area has of the total quota, they would appear in the following order:

Area	Percentage of Total
Cuba	28.60
Domestic beet sugar	23.19
Commonwealth of the Philippine Islands	15.41
Hawaii	14.04
Puerto Rico	11.94
Mainland cane sugar	6.29
Foreign countries other than Cuba	.40
Virgin Islands	.13
Total	100.00

The Secretary also determines the consumption of sugar in Hawaii and Puerto Rico and accordingly sets quotas for sugar to be marketed there locally. In the event that any area is not able to fill its allotted quota in a given year, the deficiency is to be prorated for that year among other areas on a predetermined basis. The quotas for each area are further subdivided into quotas for each mill and individual producer, based upon their past production or present ability to market the quota allotted.

The Act specified the maximum amounts of refined sugar (known as direct-consumption sugar) which could be included as part of the quotas for each offshore area until February 29, 1940. During the remaining ten months of 1940 there was no limitation on refined sugar, but with the beginning of 1941 the former limitations were re-imposed. Li-

quid sugar quotas, in terms of wine gallons of 72% total sugar content, are established for Cuba (7,970,558 gallons) and for the Dominican Republic (830,894 gallons).

Provision is made for benefit payments to beet and cane growers in continental United States, Hawaii, and Puerto Rico, who comply with the conditions applicable to labor, wages, farming, producing, and marketing as specified in the Act. Payments are also authorized in connection with abandonment of planted acreage and crop deficiencies of harvested acreages resulting from drought, flood, storm, freeze, disease, or insects. The payments are based on each hundredweight of sugar or liquid sugar, raw value, produced and are at the following rates:

Short Tons Produced	Rate of Payment Per Hundredweight
First 500	$0.600
Next 1,000	.550
Next 4,500	.525
Next 6,000	.500
Next 18,000	.475
All over 30,000	.300

The Act fixes an excise tax of $0.50 per hundredweight on 96° raw sugar and $0.535 per hundredweight on refined sugar for all sugar manufactured in the United States (including Alaska, Hawaii, and Puerto Rico). This tax is to be paid by the manufacturer.

<u>Some results of the Sugar Act of 1937.</u>

The Sugar Act of 1937 and its predecessor, the Jones-Costigan Act, represent an almost complete departure

from the doctrines of laissez-faire. (Although the Jones-Costigan Act was passed in 1934, the first Puerto Rican crop to be affected by it was the 1934-35 crop. Accordingly, in the following discussion, 1935 is frequently referred to as being the effective date of the legislation.) Far reaching government control is here exemplified. The circumstances which led to their adoption were briefly these.

After the first World War there was a short-lived boom in sugar which saw raw sugar (duty paid) selling at 23.5 cents a pound in 1920. Almost everywhere productive facilities were expanded as rapidly as possible and the price dropped to an average of 4.76 cents a pound in 1921. In an attempt to offset lower prices producers increased their volume of production each year but the inevitable result was a still lower price. This downward trend of prices proceeded almost without interruption until the United States quota legislation became effective in 1934. The theory of the American quotas is that, given a market protected by sufficiently high tariff and quota walls, the price of sugar may be influenced through control of the supply. To a degree this is true, but there are other factors which must also be considered.

Recognizing the existence of a serious over-production, Cuba in 1926 tried a single-handed experiment in limitation. Like similar schemes which have been tried for other commodities, this one failed because, while Cuba was

cutting her production, other countries expanded theirs. The next attempt of Cuba's was the so-called Chadbourne Plan under which export quotas were adopted by all sugar producing nations. It became effective in 1931 but failed to stimulate sugar prices because its quotas were too high in the face of a decreasing world demand.

The present quota system in the United States is primarily concerned with price stabilization through control of supply. Following its inception the price decline was definitely checked, but since that time further decreases have occurred. Market conditions change rapidly and if the Secretary of Agriculture sets quotas which turn out to be in excess of actual demand, prices are bound to drop. Conversely, if the quotas have been under-estimated and then demand picks up, the price of sugar must rise. The situation in September, 1939 resembled this somewhat. Fearing a sugar shortage, the housewives of the country began buying in such volume that the price went up before any adjustment of quotas could be effected. It required complete suspension of all quotas for three months and a flood of sugar from the producing areas to restore the price to its former level.

From their very nature the quotas represent an arbitrary division of the American market among the areas referred to. Since the determination of the total quotas rests with the Secretary of Agriculture and the share of each area in that total quota is stipulated in the Act it-

self, the background is largely political. When the legislators were framing the Act there was a powerful tug-of-war between the lobbyists representing the interests of each area. This was only too evident when the question of refined sugar was under discussion. The offshore areas are definitely discriminated against in the Act because they alone are restricted in the amounts of refined sugar which they may include in their quotas. For example, in 1939 Puerto Rico's quota was 806,642 short tons of sugar, but of this total only 126,033 short tons could be made up of refined sugar. No such restrictions of refined sugar apply to mainland producers.

When the Act was being considered the Department of the Interior made clear the attitude of the administration on that point when it said: (1)

> "The provisions . . . . are in complete violation of traditional American policy and of basic American principles. These discriminatory provisions establish trade barriers within the United States. These provisions establish that a certain part of the Union may not manufacture, may not process the products of its soil. . . . It establishes discriminations . . . . in favor of a few mainland companies already highly privileged by this legislation. These discriminations . . . are contrary to contemporary American policy by establishing an Old World colonialism in America. The essence of Old World colonialism was the right of the mother country to exploit these colonies, to consider their

(1) Memorandum of the Department of the Interior (Quoted in The New York Times, August 5, 1937).

> "citizens as occupying a secondary and inferior status and to place economic obstacles in their path in favor of commercial interests in the mother country."

These refined sugar restrictions were written into the law at the insistence of the "unholy alliance" (so called by President Roosevelt) of the producer states and the refiners. The president had actually threatened to veto the Act because it provided "a status quo continuation of this seaboard refinery monopoly". (1). The reason for this is that in the past it was customary for the tropical producers to turn out only the raw sugar, and for the refining processes to be carried out along the mainland seaboard (on both the east and west coasts). Refining formerly involved large investments in expensive bone-char filter plants, but new processes were invented which made it possible to refine sugar at a much lower cost. Taking advantage of the new methods, some of the tropical mills which had been turning out only raw sugar began to refine their raw product themselves. The answer of the mainland refiners to this new competition is seen in the Act. The result is that one section of American industry is being protected against another section and the unorganized, uninformed consumers pay the bill.

During the last ten months of 1940 (when there were no restrictions on the amount of refined sugar which could be included in the quotas), those Puerto Rican mills which

(1) Quoted in Business Week, (September 11, 1937).

also have refineries were able to market somewhat larger percentages of their quotas in the form of refined sugar. However, they feared the re-establishment of limitations and did not expand refining capacity. Their fears turned out to be well founded.

Under the Jones-Costigan Act of 1934 quotas were assigned to the offshore (including Puerto Rico) and foreign areas in proportion to their sales of the three most representative years in the nine-year period from 1925 to 1933. Puerto Rico's quota was allotted on the basis of its sales for the years 1931, 1932, and 1933. This resulted in the island receiving 12.44% of the total United States quota. Insular dissatisfaction with this percentage is indicated in the following comment: (1).

> "Although these years gave Puerto Rico the highest quota possible under the provisions of the Sugar Act, the 1925-1933 period included two years in each of which the crop was damaged around 200,000 tons by hurricane and one year in which extreme drought cut the crop by an equal amount. Earlier years were prevented from being representative by sugar cane diseases which reduced both acreage and yields."

The word "representative" should here be interpreted as "greatest".

Dissatisfaction in the Puerto Rican sugar industry increased still further when the Sugar Act of 1937 reduced the island's participation in the American market to 11.94%.

(1) Smith, Dudley, and Requa, William M., Puerto Rico Sugar Facts, (Washington, 1939), p. 106.

In all of this discussion it should be remembered that the island is not even classed as a territory such as Alaska and Hawaii; nor do its residents have any voice in national elections. It sends no senators nor congressmen to Washington; it must be content with a resident commissioner who is the accredited representative in Washington but has no vote in Congress. Politically impotent (nationally), the island must depend on influencing mainland and congressional opinion by other means than the polls. Various agencies have attempted to state Puerto Rico's case before continental United States but mainland apathy for a little known possession has so far proven too great a handicap for a fair trial.

For this company, as for all companies, the first and most direct result of the legislation was a sharp drop in cane acreage and sugar production. The cane crop of the company was reduced more than 30% to meet quota requirements. The program has also made the producing of cane very attractive to independent farmers. In 1934 there were 197 colonos supplying the company with their cane but in 1940 their number had been swelled to no less than 330, an increase of more than 67%. All of these new colonos were provided with quotas (when limitation of supply was supposed to be a primary objective), however small, and this had the effect of distributing the quota for the mill area over a larger number of farmers. The established growers were the ones who had to make the greatest adjustments.

A comparison of sugar production for the six years preceding the passage of sugar legislation (1929 to 1934, inclusive) with the production for the six years following the enactment of this legislation (1935 to 1940, inclusive) shows that the company produced an average of 13,606 tons annually during the former period and an average of 15,518 tons annually during the latter period. That this company was no exception is shown by a similar comparison for the island as a whole. For the period from 1929 to 1934 the combined annual production of all companies averaged 844,754 tons and for the period from 1935 to 1940 the annual average was 940,598 tons. (1). This does not appear to resemble a program of restriction and requires a word of explanation. Prior to 1935 the trend of sugar production in Puerto Rico was steadily upward, reaching 1,103,822 tons in 1934. (1). How long that trend would have continued and what point it would have reached, had it been left free from legislation, is still a matter of conjecture. The point is, however, that the normal growth of the industry was greatly retarded and it has been restricted to the extent that it may now increase production only as permitted by its share of the quotas. It has had to make relatively greater sacrifices than other quota areas. The total American quota, although it has been increased and decreased from year to year, has been somewhat larger each year than it was in 1935.

(1) Based on data obtained from the Puerto Rico Department of Agriculture and Commerce.

While not at liberty to divulge the actual results of operations of the company, it is pertinent to point out that its average annual loss for the five years following the effective date of the legislation was somewhat greater than that for the five preceding years. And this in spite of benefit payments and increased output.

The effect of the Act upon the wage scale of this and all companies has been mentioned in Chapter Six. The Secretary of Agriculture is authorized to set wage scales for field employees engaged in the production of sugar cane, if the grower of that cane wishes to enter into a contract with the Agricultural Adjustment Administration and receive the benefit payments which accrue under the Act. In Puerto Rico the wages paid to field workers are set annually through the convenios and it has been the practice of the Secretary to place his approval upon the rates after the collective agreements have been signed. As previously pointed out, wages in both the field and the mill have been increasing in recent years. Of course, the Secretary has no jurisdiction over wages paid in the central, and his approval of field wages follows their establishment locally, so that it is questionable whether one can say that the higher level of wages prevailing to-day is directly a result of the Act.

Whether the company is better off as a result of the legislation in effect at the present time is rather hard to say. Since no one knows what conditions would prevail to-

day if there had been no Sugar Act of 1937, the only basis for comparison is with the conditions prevailing prior to its enactment and the trends which were in evidence at that time. It has already been pointed out that production to-day is somewhat greater but not as great as it might have been if it were unfettered. The earnings of the company are slightly poorer than they were previously. A major purpose of the Act was to stabilize the price of sugar but the trend of sugar prices since 1935 was almost steadily downward until recent months when they moved up along with other commodity prices.

The attitude of the company, as expressed by a responsible official, is that, all things considered, it is somewhat better off as a result of the Act. If production had been permitted to continue at its former pace there is no telling to what levels the price might have been depressed in such a saturated market. It is quite obvious that with unrestricted production, prices since 1935 would have been lower than they were with controlled production. Its major arraignment of the Act is that the quota rates favor other areas at the expense of Puerto Rico.

To complete this discussion of the Agricultural Adjustment Administration, there is appended below a summarized schedule of the payments made in Puerto Rico by the Agricultural Adjustment Administration for the crop-year 1939-40. These pertain entirely to growers of sugar cane. (1)

(1) Sugar Section, Agricultural Adjustment Administration, San Juan Office.

Amount of Payment	Puerto Rico Number of Payments	Puerto Rico Amount Paid	Company Number of Payments	Company Amount Paid
$1-$250	8,080	$ 716,744.61	261	$ 30,518.70
$250-$500	1,677	593,015.43	41	13,982.97
$500-$1,000	856	603,835.89	13	9,268.33
$1,000-$1,500	287	351,500.29	2	2,377.39
$1,500-$2,000	166	284,048.94	3	4,916.25
$2,000-$3,000	176	419,658.75	6	13,035.60
$3,000-$4,000	91	308,205.57		
$4,000-$5,000	46	205,818.46	1	4,526.48
$5,000-$6,000	46	254,483.43		
$6,000-$7,000	35	227,813.16	1	6,742.01
$7,000-$8,000	19	141,678.46	1	7,707.58
$8,000-$9,000	18	152,113.25		
$9,000-$10,000	13	123,163.06		
Over $10,000	111	6,235,664.12	1	98,181.94
Total	11,621	$10,617,743.42	330	$191,257.25

This table is really supplementary to the table in Chapter Four which shows the frequency distribution of cane marketed for the same year. Although the above tabulation is prepared on a different basis than the one for cane marketed, it brings out substantially the same results. Referring to the data for the company, it is shown that those colonos who received less than $500 each comprised 92% of the total number to receive benefit payments in that year, but their aggregate payments were only 23% of the total amount paid in the mill area. The single payment in excess of $10,000, paid to the company itself, represented 51% of the total amount paid.

On a larger scale the same holds true for the island as a whole. The total number of payments of less than $500 each, or 84% of the total number, accounted for only 12% of the total amount paid. The 111 payments in excess of

$10,000, or less than 1% of the total number, made up 59% of the aggregate amount paid. It should be recalled that this situation prevails in spite of the fact that payments to cane growers are on a sliding scale which pays the grower of less than 500 tons of sugar at the rate of $0.60 per hundredweight, and the grower of more than 30,000 tons at rates which decrease to only $0.30 per hundredweight, or exactly one-half the base rate.

Wage and hour legislation.

The company is subject to legislation regulating wages and hours but the various pieces of legislation do not apply uniformly to all activities. Under present insular legislation (1) a working day of eight hours is the maximum for all employees, both in the mill and field. In the event of a special emergency employees may work more than eight hours if the approval of the governor and the commissioner of labor is obtained, and providing they are paid at the rate of twice their usual pay for the excess time over the basic eight hours. These same provisions are also written into the convenios.

As a specific example of the result of this legislation, the situation prevailing in the mill prior to 1936 will serve. Previous to that year the mill had been operated on two shifts of twelve hours each while the grinding season was in progress. Beginning in 1936 the working day was

(1) Law No. 80 of May 5, 1931 and Law No.49 of August 7, 1935.

shortened to eight hours and the mill had to change over to three shifts of eight hours each in order to maintain continuous operations during the period of grinding. The net result there was an increase of about 50% in the number of central workers during the busy season.

Although the eight-hour day is the maximum set by law, there are certain classes of field workers whose working day is limited to seven hours by the collective agreements. However, they do not constitute a very numerous group.

Federal legislation regarding wages and hours, as exemplified in the Fair Labor Standards Act of 1938, applies only to the men who are employed in the mill itself. The significant part of this Act for the subject company is the part dealing with rates of pay. The company is complying with the present minimum rate of $0.30 per hour for its mill workers. The applicability of this Federal legislation is based on the theory that the central is engaged in manufacturing a product which will enter the channels of interstate commerce and is therefore subject to the Act.

There were originally some cases of litigation before it was finally decided at which point of operations the law governing interstate trade became effective. For some time the workers engaged in transporting the cane to the mill were on the border line. The Wages and Hours Administrator contended that they were subject to the provisions of the Act and the companies alleging the contrary. In February,

1940, however, the Federal District Court in San Juan ruled that transportation in interstate commerce did not begin until the cane had been delivered to the central. (1). As a result of this the men employed in transportation of cane to the central were held to be exempt from the provisions of the Act.

As previously mentioned, the regulation of wages of field workers is that which stems from the authority granted the Secretary of Agriculture by the Sugar Act of 1937.

It might be pertinent to mention that the whole question of the applicability of the Federal Fair Labor Standards Act to Puerto Rico has been vigorously contested by almost every industry affected. Their contention is that the entire insular situation is radically different from that in any part of continental United States and that it would prove ruinous and confiscatory if the Act were to be enforced in all of its provisions. It proved to be such a hardship for some branches of mainland controlled industry (other than sugar) that they abandoned operations on the island and moved elsewhere. The Puerto Rico Department of Labor, recognizing the seriousness of the situation, has made representations to the Wage and Hour Division of the United States Department of Labor in an effort to secure amendments to the Act in behalf of certain types of insular industry. Consideration is being given to this matter presently.

(1) Reported in The New York Times, (February 9, 1940).

Although the company is naturally averse to arbitrary increases in the wage scale of its mill workers, it would not appear that it has been seriously affected by them. Two reasons may be adduced for this. Firstly, the mill employees constitute only one-seventh of the total average number of employees of the company and during six months of the year the number employed in the mill is less than the annual average for the mill. Secondly, the increased productivity of the mill workers has had the tendency of offsetting the higher wages required by the Act.

Colono legislation.

Among the important pieces of legislation which govern the operations of the company is Law No. 112 of May 13, 1937, as amended by Law No. 213 of May 15, 1938. This provides the basis for the payment to colonos for the cane which they deliver to the central. Inasmuch as this was fully discussed in Chapter Three in connection with colono relations, all that needs to be said here is that, like most legislation of a regulatory nature, it was contested in the courts by some companies. They attacked it as being unconstitutional and confiscatory but the courts upheld it and commented that the legislation was well within its rights in setting up intervention on behalf of the colonos.

Taxation.

Because of the great importance of the sugar industry in the economy of Puerto Rico it is only natural that

its contribution to the support of the Insular Government should be correspondingly large. The many ramifications of the industry make it difficult to determine the exact share of taxation which it bears. The numerous enterprises which depend upon the industry and the men employed by the industry contribute taxes which are derived from it but which are not susceptible of accurate statistical analysis. Nevertheless, data have been assembled for those payments which are considered as direct payments by the industry, including estimates for the portion of colonos. These show that the industry is the largest single contributor to the insular treasury, accounting for about 23% of total public revenue. Its share varies from 11% of all excise taxes to 45% of all income taxes. However, property taxes (of which it pays 35% of the total) account for the largest dollar share; about one-half of the industry's taxes are paid in the form of property taxes. (1).

Leaving aside the controversial question of whether the industry pays its equitable share of taxes in general, some idea of the form and burden of these taxes may be secured from an analysis of them as they affect the subject company. In Chapter Five it was shown that 3.5% of the total revenue of the company went for taxes but this must be slightly qualified by pointing out that some of the smaller taxes are not

(1) Bird, E.A., The Sugar Industry in Relation to the Social and Economic System of Puerto Rico, (Puerto Rico Reconstruction Administration, 1937), pp. 101-102.

segregated in the accounting but are charged, together with the items to which they apply, to other accounts where they are not readily identifiable as taxes. Notwithstanding this, an analysis of the more important taxes paid in the year 1940 was undertaken which showed that the tax bill of the company was somewhat in excess of 5% of its total revenue for that particular year. If any liability for income tax had been incurred the percentage would no doubt have been higher.

The more important levies, including those for both the partnership and the corporation, are summarized as follows:

Property taxes	$26,906
Sugar production tax	13,891
Duties on sugar bags	5,348
Gasoline tax	2,880
Molasses production tax	2,487
Sales tax	2,343
Total	$53,855

The property taxes are based on the application of a rate to assessed valuations of real and personal property. This levy is collected by the Insular Government and a large portion of it is turned over to the municipalities, for which it constitutes an important source of revenue. The most common criticism of the property tax is that it is based on assessed valuations which are, in most instances, below the true value of the property. For the most part, the valuations in effect to-day were established years ago and there has been no systematic attempt at revision. In addition, taxpayers may readily appeal their assessments and request a review by a public board. The record of the board shows that

it has been extremely lenient in its treatment of appeals, making substantial reductions of assessments. (1).

The sugar production tax is classified as an excise tax and is at the rate of four cents per hundredweight of sugar produced. Inasmuch as the great bulk of the sugar produced is exported to the mainland the tax is practically an export tax. Ordinarily a country or area which is endeavoring to develop a local industry would find it disadvantageous to impose a tax upon the export of that industry's products; but in this case the moderate rate of tax and the peculiar position of Puerto Rico as a supplier of sugar to the United States tend to modify the effects of such an impost.

The bags in which the raw sugar is shipped (250 pounds to the bag) are of jute and come almost entirely from British India. They are subject to a Federal import duty (10% ad valorem, plus one cent per pound of weight) which amounts to $0.0385 per bag. The island has an unusual arrangement with the Federal government under which the latter collects all customs duties and, after deducting the costs of administration, turns them over to the Insular Department of Finance (Treasury Department). As a result, the duties paid by the company on its sugar bags go to the Insular Government, although they are Federal customs.

The gasoline tax is entirely an insular tax, no

(1) Treasurer of Puerto Rico, Annual Report for the Fiscal Year 1938-39, pp. 39-40.

part of it going to the Federal government. It is somewhat higher than similar taxes prevailing in most of the states, being at the rate of seven cents per gallon.

The tax on molasses production is a recently imposed one and is at the rate of 9/20 of one cent per gallon of molasses produced.

The sales tax is a form of excise tax. On most items it is levied at the rate of 2% but in the case of some selected articles a higher rate is in effect.

As a Puerto Rican corporation, the company is subject to the provisions of insular income tax legislation only. This means that it is not subject to Federal legislation regarding excess profits and income taxes. As mentioned at an earlier point, it has not had to pay any income taxes since its organization in 1930 because of the absence of taxable net income.

Although the taxes mentioned above do not constitute a complete roster of all taxes paid, it would appear that the company does not have to contend with the innumerable types of taxes which a company of comparable size on the mainland would have. While the portion of income which must be applied to taxes is not exactly nominal, it is a moderate burden by present day corporate standards for continental United States.

CHAPTER EIGHT

CONCLUSIONS

The economy of Puerto Rico is mainly an agricultural one in which sugar predominates. Apart from local consumption, practically all of the island's output of sugar goes to continental United States. Production for the mainland increased periodically until it was restricted by quota legislation. One of the principal factors contributing to this growth is the fact that Puerto Rico is included within the United States customs area and can market its sugar on the mainland without the payment of any duties. Its dependence on this market is so great that if, for any reason, it were to be taken away, the gravest consequences for the island would ensue.

Most of the centrales in Puerto Rico depend upon independent cane farmers (colonos) for a portion of their supply of cane for grinding and processing. The company has a uniform contract with each of its colonos setting forth the conditions under which it will purchase his cane and make advances for raising his crop, as well as the basis of payment for the cane, and related details. As a result of the contract terms the colono is subordinated to the central but it appears to work out to their mutual advantage. Most of the colonos obtain their crop loans from the company, although they are free to secure them where they will. The interest rate charged by the company is apparently rather high but

there is no evidence to show that it is the source of any great profit to the company. There has always been a great deal of controversy as to the method and rate of payment for colono cane but it is now established by legislation on an equitable and uniform basis.

The yields of sugar cane per acre have been increasing from year to year but the amount of sugar per acre has increased even more rapidly due to improvements in the cane itself as a result of selective breeding and due to improved methods of grinding and processing. As a rule, the yields obtained by the companies from their own administration cane have been greater than the yields secured from colono cane. In 1940 the company produced about 55% of its own cane and for the island as a whole, 23 farms (each producing in excess of 50,000 tons of cane) accounted for 49% of all the cane grown in Puerto Rico. In some years the cane crop was afflicted with disease which practically forced experimentation with breeding and new types of cane. The agricultural experiment stations and the research departments of the larger companies have made many valuable contributions to the development of sugar and the sugar industry.

The company has had an unusual financial history from its original organization in 1911. The original company was forced into a receivership in 1922 and remained under the control of the receiver until 1930 when a new management acquired control. In 1939 the company, which had held title to

both cane land and factory, was dissolved and two new entities succeeded it. One of these has a corporate form of organization and the other is organized as a partnership but there is a joint control over the operations of each. At present the partnership has granted an option to acquire all of its cane land to a Federal agency, the Farm Security Administration, in connection with a contemplated project to split it up into 130 small farms. These are to be made available to individual farmers, most of whom are without funds to finance such an acquisition independently, and the necessary financing is to be handled through the agency. It is the first experiment of its kind in Puerto Rico and its importance cannot be under-estimated. Upon the results obtained may hang the future disposition of all large holdings of land in the island. Due to the fact that it is an innovation, the outcome of it is uncertain. It is a situation which has arisen from the statutory prohibition of any corporation owning or controlling in excess of 500 acres of land.

The company is far from 100% unionized but nevertheless it operates on the basis of a collective labor agreement. New agreements are drawn up annually and some modifications are incorporated therein each time. The principal provisions concern rates of pay and the length of the working day. The general effect of them is to favor the employees. The company has not been entirely free from strikes but in recent years there have been none of a serious nature. Although

wage scales have been increasing in recent years, they are still low by mainland standards and have probably not increased the unit costs of production. As no data for costs of living are available, the effect of the wage increases upon real wages cannot be determined. The bugbear of labor, however, is the seasonal nature of employment. Because of this, daily wage rates provide no indication of the annual earnings of a worker. In general, the standards of living of the workers are very low and, with the large surplus of labor available, it is hard to see how any improvement in them can be effected under existing conditions. Wage and hour legislation is in effect but it is difficult, if not impossible, to amend economic laws by legislation. The case of certain insular industries is cited where, when higher levels of wages were imposed, the companies affected gave up their insular operations and moved elsewhere. The wages paid in the mill are subject to the provisions of the Federal Fair Labor Standards Act and those in the field are subject to approval by the Secretary of Agriculture.

Certain facts about the Puerto Rican economy should here be set down again both for emphasis and background. There is a tremendous pressure of population in the island which, when reduced to numerical terms, is evidenced by the 544 people per square mile and the 1.18 acres of land per capita (less than one acre per capita if stated on the basis of arable land and pasture). Instead of showing any signs

of decreasing, the population, on the contrary, continues to increase steadily. This places the island in the position of having a large excess labor supply which, together with the low per capita production of wealth, keeps wages at a low level.

Under these circumstances the needs of the island are best met by a crop which employs a large number of people and has a high per-acre value. So far sugar has met the requirements better than any other single crop. The intensive cultivation of this crop produces yields with a value far in excess of those which could be obtained from other crops on the same land. Of course, some food crops are raised but the island depends largely on mainland sources for the great bulk of its food supplies. With the natural growth of the sugar industry impeded by quota restrictions, there are available areas which are susceptible of further utilization for subsistence crops, but there is naturally a limit to such utilization.

Seasonal unemployment in the sugar industry presents its own problems but there remains the larger problem of those who seldom, if ever, have employment. The Federal government has taken cognizance of the situation and in recent years has made large appropriations for relief and, through the Puerto Rico Reconstruction Administration, has provided a program of rehabilitation with the object of providing employment opportunities. But the relief expenditures

are only palliatives and will not provide a lasting solution.

At the time the Sugar Act of 1937 was under consideration the United States Department of Agriculture filed a statement which contained some interesting information regarding the cost of sugar in mainland markets. (1). It estimated the cost of the national sugar policy to domestic consumers in 1936 as $313,549,000, which was increased in 1937 by $70,000,000 because of the excise tax imposed by the Act. The total payments by consumers for sugar in continental United States in 1936 were estimated at $713,995,000. This means that, after giving effect to the excise tax referred to, the price paid by consumers was almost double a natural price for sugar. The excess was roughly the amount which consumers had to pay over and above the "free world price" of sugar on account of the excise tax, duties, and protection (through quotas) for the industry. Puerto Rico is benefited from its inclusion within the United States customs area as it markets its sugar on the mainland duty free, while Cuba, for example, pays a duty of $0.90 per hundred pounds (all other countries pay a duty of $1.875). It also receives benefit payments which Cuba does not. Cuba can compete on this basis, however, because of the extremely low labor costs prevailing there and the high fertility of its soil which does not necessitate the application of fertilizer to the extent essential in Puerto Rico.

(1) Reported in The New York Times, September 26, 1937.

But the production of sugar in continental United States is a comparatively expensive process. Yields per acre are much lower for both sugar beets and cane, and labor is higher. Taking a five-year average for the years from 1935 to 1939, inclusive, the following shows how the yields of sugar per acre compare for three different areas: (1).

Area	Tons of Sugar Per Acre
Puerto Rico	3.57
Louisiana and Florida	1.79
Mainland sugar beets	1.71

> "The fact is that every acre devoted to sugar cultivation in Europe (and for that matter in the United States) is sheer waste. The cheap sugar cane whose yield is more than ample to supply world demand . . . can be grown only in the tropics. In the temperate zones, where the industrial nations are concentrated, sugar must be produced from the beet at vastly greater cost and in smaller volume." (2).

If the sugar industry were operating in a free economy beet sugar and mainland cane sugar could not be sold in the United States until the demand of the market far exceeded anything that has yet been seen. But the western beet growers are well represented in Congress and are secure with their quota of 23.19% of the entire American market, second only to that of Cuba. It has been estimated that

(1) Farr's Manual of Sugar Companies, (New York, 1940), pp. 163, 170, and 189.

(2) Janeway, Eliot, Sugar - A Case History, (Asia Magazine, August, 1937).

there is an investment of $700,000,000 in sugar growing within continental United States (1) and, largely to support this investment, consumers have to pay well over $300,000,000 in higher sugar prices annually. Even Secretary of the Interior Ickes once said: "The beet sugar industry has no justification for existence. It is kept alive by artificial means and is a detriment to itself and the country." (2).

Puerto Rico is one of the insular possessions of the United States where sugar can be produced at a lower cost than on the mainland and where sugar fits into the mono-cultural economy of the island better than any other crop. The amount of its production is now limited and that, in turn, limits employment and the purchasing power which derives from the industry.

The situation then is this. Sugar produced in continental United States is high in cost but continues to be produced because it is subsidized by quota, tariff, and excise tax. Puerto Rico is in a position to produce more cheaply and to supply a far greater share of the domestic market than the island is permitted to under existing legislation. Refined sugar, too, can be produced more cheaply in the island than on the mainland, but the Sugar Act of 1937 specifies that only a small portion of the island's total quota can be filled with refined sugar. Puerto Rico's quota

---

(1) Quoted in editorial, New Republic Magazine, (August 18,1937).

(2) Quoted in Time Magazine, (February 10, 1941).

share represents discrimination but it is almost powerless to modify the situation created because it has no real voice in national affairs and has to accept whatever Congress metes out to it.

What has already been said in a general way applies, of course, to the subject company, but there are other considerations which come up in any discussion of the future of the company. Because of the contemplated sale by the land-holding partnership of the cane land which it owns and the uncertainty surrounding the disposition of the leased cane land, it is practically impossible to form any opinion as to what the company's future prospects will be. Some of the possibilities were weighed in Chapter Seven but until the plan has been put into effect and some of the actual results observed, it would be injudicious to prognosticate.

In considering prospects for the future there is one potential source of additional income which has thus far received little attention. The by-products of sugar are the cane foliage, bagasse, blackstrap molasses, filter mud, and bagasse ashes. There is practically no value to the ashes and foliage and the others have only a small value in their present state. However, with additional processing, all of them either become more valuable or produce items of greater value. (1).

(1) Based upon an article by Rafael Arroyo, By-Products of the Sugar Industry, (Facts About Sugar Magazine, February, 1940), pp. 64-65.

There are already being produced commercially the following products derived from blackstrap molasses: industrial alcohol, rum, butanol and acetone (two widely used solvents), and citric acid. In the process of development are the following derivatives: normal butyric acid, propionic acid, acetic acid, other miscellaneous acids, compressed yeast, and glycerine. All of these have a higher value by far than the blackstrap from which they are made.

The cane foliage and bagasse offer two little used sources of cellulose. They can be used in making building and insulating materials, plastics, a decolorizing char, and many other products with a cellulose base.

The filter mud, heretofore used mainly as a low grade fertilizer, provides the raw material for the production of activated char and cane wax.

The ashes which remain after the bagasse has been burned contain silicates of sodium, calcium, and potassium which could be utilized in manufacturing the lower grades of glass, such as bottles.

In 1939 the United States Patent Office granted a patent for the synthesis of rubber from ordinary sugar and turpentine. All of the chemical and physical properties of natural rubber are said to be possessed by the product. (1).

The industry has been compared with the packing

(1) Patent number 2,150,068, reported in The New York Times, (March 12, 1939).

industry in its earlier days when it failed to make any use of its numerous by-products, only to learn later that by full utilization of them they could be almost as profitable as the principal products. The time is probably coming, however, when the sugar industry will profitably come to a similar conclusion.

It is not within the scope of the present study to analyze in detail the economic problems confronting the island. Although sugar is the principal crop in Puerto Rico, accounting for 64% of all exports in 1938, it should be understood that it is not suggested that the solution of sugar's problems would by any means also provide a remedy for all of the economic ills of the island. Anything which would help the sugar industry would, of course, be of benefit to the island as a whole, but there are other far reaching problems of an economic nature, in addition to those pertaining to sugar, which remain unsolved.

BIBLIOGRAPHY

While all of the sources shown below have been utilized in the preparation of this study, those which have been used most were "The Sugar Economy of Puerto Rico", by Gayer, Homan, and James, "The Sugar Industry in Relation to the Social and Economic System of Puerto Rico", by Bird, "Puerto Rico Sugar Facts", by Smith and Requa, and "Porto Rico and Its Problems", by Clark. The extent to which these and the other sources have been used is indicated throughout the body of the thesis by the foot-notes.

Arroyo, Rafael, By-Products of the Sugar Industry, Facts About Sugar Magazine, Jersey City, February, 1940.

Bird, Esteban A., The Sugar Industry in Relation to the Social and Economic System of Puerto Rico, Puerto Rico Reconstruction Administration, San Juan, 1937, published by the Senate of Puerto Rico, 1941.

Bird, Jorge, The Economic Factors of the Central Sugar Mill, The Book of Puerto Rico, San Juan, 1923.

Chardón, C.E., The Varietal Revolution in Porto Rico, The Journal of the Department of Agriculture, Río Piedras, 1927.

Clark, Victor S., et al, Porto Rico and Its Problems, Brookings Institution, Washington, 1930.

Dalton, John E., Sugar - A Case Study of Government Control, The Macmillan Company, New York, 1937.

del Valle, Manuel A., Proceedings of the International Society of Sugar Cane Technologists, San Juan, 1932.

Farr & Co., Manual of Sugar Companies, New York, 1939, 1940.

Gayer, A.D., Homan, P.T., and James, E.K., The Sugar Economy of Puerto Rico, Columbia University Press, New York, 1938.

Gilmore, A.B., Puerto Rico Sugar Manual, New Orleans, 1934.

Government of Puerto Rico:

Second Annual Report of the Governor of Puerto Rico, San Juan, 1902.

Department of Agriculture and Commerce, Annual Book of Statistics, San Juan, 1939.

Department of Agriculture and Commerce, What Sugar Means to Puerto Rico, San Juan, undated.

Annual Report of the Treasurer of Puerto Rico: 1938-39, San Juan, 1939.

Government of Puerto Rico (continued):

The State Insurance Fund of Puerto Rico, Workmen's Compensation in Puerto Rico, Bulletin No. 2, San Juan, 1940.

Porto Rico Agricultural Experiment Station, Annual Reports, San Juan, 1922, 1923.

University of Puerto Rico Agricultural Experiment Station, Annual Reports, Río Piedras, 1938, 1939.

Janeway, Eliot, Sugar - A Case History, Asia Magazine, August, 1937.

López Domínguez, Francisco, Origin and Development of the Sugar Industry in Puerto Rico, unpublished.

López, William D., The Labor Problem in Puerto Rico, mimeographed, Puerto Rico Department of Labor, San Juan, 1935.

Moberly, G.S., Proceedings of the International Society of Sugar Cane Technologists - Fifth Congress, San Juan, 1935.

Picó, Rafael, The Agricultural Problems of Puerto Rico, Puerto Rico Reconstruction Administration, San Juan, 1936.

Rodríguez, A.P., A Report Dealing With Labor Statistics, Cost of Living, Housing Conditions and Craftsmanship of Workers in Puerto Rico for the Fiscal Year 1933-34, Department of Labor, San Juan, 1934.

Romaguera, Arturo, Modernization of Milling Equipment, Facts About Sugar Magazine, Jersey City, February, 1940.

Smith, Dudley, The Job Being Done by Sugar in Puerto Rico, Association of Sugar Producers of Puerto Rico, Washington, 1940.

Smith, Dudley, and Requa, William M., Puerto Rico Sugar Facts, Association of Sugar Producers of Puerto Rico, Washington, 1939.

United States Bureau of Census, Fifteenth Census of the United States: 1930, Sixteenth Census of the United States: 1940 Preliminary.

United States Department of Agriculture, Agricultural Adjustment Administration, Sugar Section, Release of August 24, 1936.

United States Department of Commerce, Statistical Abstract of the United States, 1939.

United States Tariff Commission, Report to the President on Sugar, Report No. 73, Second Series, Washington, 1934.

United States War Department, Census of Puerto Rico: 1899.

Willcox, O.W., Can Industry Govern Itself - An Account of Ten Directed Economies, W.W. Norton & Company, New York, 1936.